FOOD MANUFACTURE

Incorporating Food Industries Weekly

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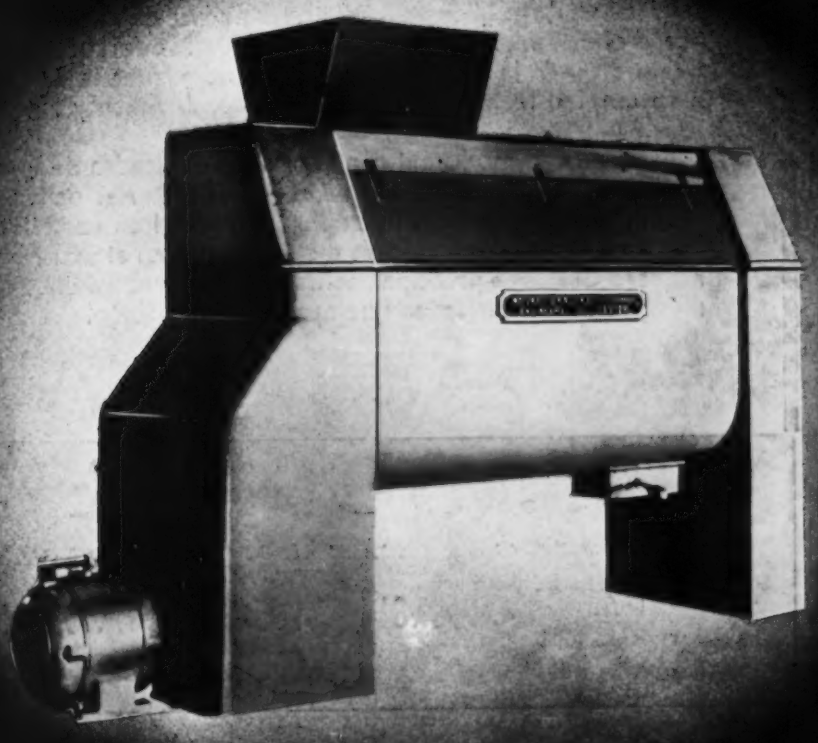

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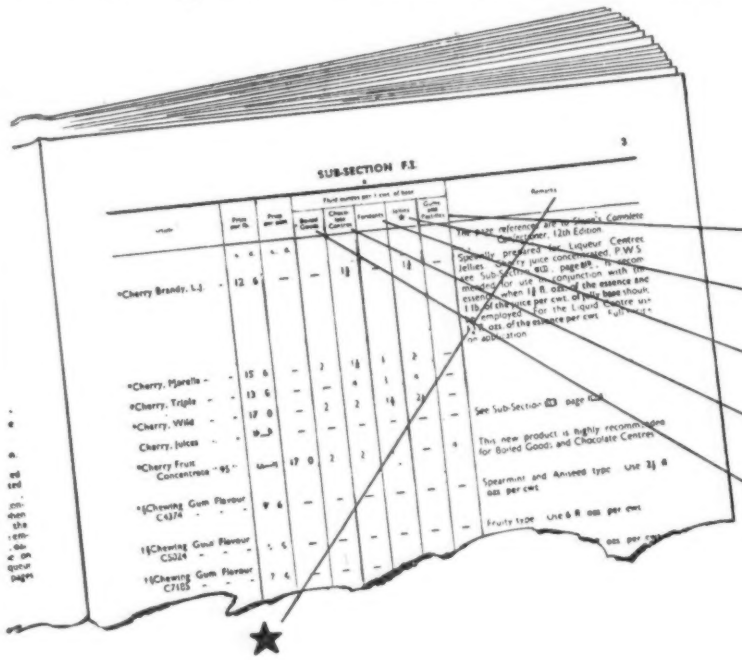
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3
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FOOD MANUFACTURE

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The Editor will be glad to consider contributions from those engaged in the Food Industry. Articles intended for publication should be of a practical nature and accompanied by photographs or drawings when possible.

A horde of Silent Invaders

A horde of silent invaders is ravaging the nation's war-time larder. According to Lord Woolton, the 40,000,000 rats in the country are devouring food and property to the extent of £1 per head—£40,000,000 worth annually. He reminded all with rat-infested premises that if urgent action were not taken to exterminate the rats, the Government have the power to compel the work to be done.

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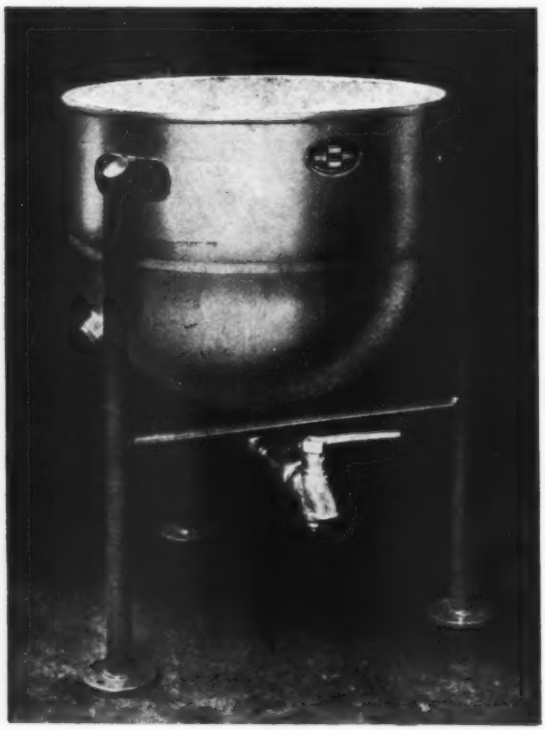

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FOOD MANUFACTURE

Vol. XVI, No. 4 April 4, 1941

Trade with Latin-America

THE GRATIFYING WELCOME accorded in South American countries to the Willingdon Mission is a further token of traditional friendship which has existed for so many years.

As Mr. Oliver Lyttelton pointed out in a broadcast talk to Latin-America on February 21, the United Kingdom was the greatest buyer of the products of other nations, and the British people knew that full prosperity could not return to their friends in South America until they could resume normal trade with them unhindered by the needs of the war. After discussing the necessity for going without many things ordinarily thought indispensable, Mr. Lyttelton passed on to the question of exports. We still had plenty of goods to export, but we could not afford to pour them out in a lavish and extravagant way. Thus he had told the business public in the United Kingdom that an Order had been made which would require them to obtain licences before they could export any class of goods to a number of countries in South America. It did not mean that exports would cease or even necessarily that they would diminish in volume; it meant that they would be carefully selected, taking account of South American needs to help us to pay for our imports of food and materials. The prosperity and peace of mind of the countries in South America were also at stake in this war, and we were determined to use all our natural resources to one end—victory and victory soon. That victory would be theirs as well as ours, and we were as resolved to stop the pestilence of persecution and cruelty from spreading to the new world as we were to arrest it and drive it out from the old.

The Apotheosis of the Potato

Lord Bledisloe, in a recent letter to *The Times*, describes the potato as a sovereign food in war-time, and contends that bread is not the staff of life under these conditions.

The figures he quotes are interesting. The average yield per acre of potatoes is exactly 7½ times the average yield of wheat after allowing in each case for the seed. Potatoes yield 4,700,000 calories per acre against 2,100,000 calories yielded by wheat, and are richer in vitamins, although in both cases, Lord Bledisloe points out, these need supplementing with milk, green vegetables and fruit.

Starch in Bread

The recent interest on the subject of additions of potato starch and farina to flour for bread-making purposes has been marked, and it may be mentioned that about eighteen months ago workers in America carried out some very interesting work on the effect of small additions of sweet-potato starch to flours for baking. D. Scrivanich (*Baker's Tech. Digest*, 1939, **14**, 63, 67) found that the addition of 1 per cent. of sweet-potato starch, based on the weight of flour, gave a bread which, although lighter in weight, had a greater volume and greater compressibility after three days, and that the grain, colour of the crumb, texture and the appearance of the crust were all superior to the loaf without the addition. Cake batter containing 1·83 per cent. of sweet-potato starch on the weight of the flour showed a lower moisture loss after four days, and the addition of amounts varying from 1 to 1·5 per cent. improved the crust, texture, taste and flavour on the formula used.

"Audi Alteram Partem"

Considerable debate has revolved round the autonomy or otherwise of an export group of food machinery manufacturers, and in last month's issue of FOOD MANUFACTURE we gave some views of those who did not wish to relinquish their independence. In accordance with the policy of this journal, which is to endeavour to present all sides of questions affecting the food industry, we publish in the present issue an article by Mr. Norman Neville on the subject of the working of the composite group. Mr. Neville was appointed neutral General Director of the Food Machinery and Chemical Plant Export Group—the composite organisation which embraces the six original groups which have now become sub-groups within it.

The Allocation of Rationed Foods

One of the points urged upon the Minister of Food by the National Executive of the Labour Party some weeks ago was the organisation of canteen meals aiming at the provision of supplementary meat, cheese and tea rations for heavy workers. Miners, brass moulders, blast-furnace men, farm workers, dockers and many other categories of workers have felt a very real grievance in this matter. The problem is part of the wider problem of ensuring a fairer distribution of the available supplies of the various foodstuffs, and the Army is helping towards a solution by agreeing to a reduction in the very generous scale of rationing hitherto in force. Another desirable measure is the scaling down of restaurant meals, which have given city workers in the past a distinct advantage over factory and farm workers not catered for by canteens. It may be pointed out, however, that some newspaper correspondents have not been altogether fair to so-called sedentary workers, for a young office worker pounding away at a typewriter for several hours at a stretch may need a higher protein ration than an older man working in the mine or on the land. In the case of schoolchildren there is actually a very strong case for subsidised body-building (protein-rich) meals.

The Argentine Maize Surplus

While Brazil appears to be making respectable progress in getting rid of surplus coffee by conversion into plastics which can compete in foreign markets, the great neighbouring republic is faced with the formidable problems arising out of the temporary loss of the greater part of its pre-war maize export trade. The Argentine Government has been buying up the unsaleable stocks of maize in the hands of the growers at the rate of 37.50 pesos a ton, and has accumulated a stock of 7 million tons in this manner. A plan for disposal which appealed to the Government was to sell it to the British-owned railways at 20 pesos a ton for use as fuel in place of Welsh coal. But even with the latter at 60s. a ton delivered Buenos Aires the railways still found it more economical to stick to coal. There was also the important consideration that ships bringing coal from England could return with Argentine products. The problem may be solved to some extent by a partial resumption of the maize export trade, which had fallen in 1940 to 1,874,000 tons.

Yeast Growth Factors

All strains of yeast contain the vitamin B group of substances which are indispensable to the healthy growth of these organisms. The group includes aneurin, lactoflavin, pantothenic acid, choline and nicotinic acid, all of which, it is significant to note, are also essential factors in human health. Yeasts also contain protein matter, but it has not hitherto been established to what degree, if any, the amino acids of yeast protein are indispensable in the same way as the vitamin B group. The investigations of Mitchell and Williams (*Biochemical Journal*, December, 1940) have now shown that the amino acids are not strictly essential to the growth of yeast strains, although they do exercise a valuable reinforcing action. Of the twenty common amino acids used in these experiments the most potent were glutamic acid, aspartic acid, asparagine, arginine and leucine. At least one of these (arginine) is known to be plentiful in yeast protein. This supplementary action was found to be exerted by each amino acid separately, but a mixture of all twenty amino acids was more potent than any of the individual substances. The value of the combined action of many amino acids was again demonstrated in parallel tests using a casein digest, the latter likewise proving to be more stimulating to yeast growth than individual acids.

The Effect of Ultra-violet Irradiation

Another important contribution to our knowledge of yeast growth is made by J. N. Davidson (*loc. cit.*). Extracts of yeast cells which had been exposed to the radiations from a quartz mercury vapour lamp were examined for their influence upon the growth of non-irradiated yeast (*Saccharomyces cerevisiæ*) and were found to possess exceptional growth-promoting power when compared with non-irradiated extracts. The irradiation was on a limited scale to avoid complete destruction of the cells, the degree of injury being readily followed under the microscope since dead cells stain deeply with methylene blue, whereas injured, but still living, cells do not stain. It is probable that injury by ultra-violet light stimulates the production of growth-promoting substances to an abnormal extent, this action being reflected in the superior growth-stimulating action of extracts of irradiated cells. These substances appear to be of the nature of proteins, and if this fact is definitely established, it illustrates once again the function of amino acids as supplementary rather than indispensable factors in yeast growth.

"Apparent" Sulphur Dioxide in Dried Onions

Different varieties of onions in both the fresh and dry condition were examined for sulphur dioxide by the Monier-Williams method by Drs. Bernard Dyer, J. Hubert Hamence and Mr. George Taylor (*Analyst*, January, 1941). In all the experiments evidence was obtained of sulphur dioxide, and they also indicated that in some instances more sulphur dioxide is found when the sulphuric acid produced is determined by the gravimetric than by the volumetric method.

The results also seemed to indicate that the large proportion of sulphur dioxide obtained by the gravimetric method is due, in all probability, not to the sulphur dioxide but to volatile sulphur bodies such as allyl isothiocyanate, which distil over and are oxidised to sulphates but produce no acidity.

The authors, however, are unable to state whether or not the small amounts of sulphur dioxide that are indicated by the volumetric method are really due to the presence of sulphites, or whether they may not be due to decomposition of organic sulphur compounds during distillation, and, in view of these results, they have felt reluctant to certify as containing sulphite preservative samples of dried onions yielding by the Monier-Williams method figures of the order obtained.

Plankton in Human Diet

Following on our notes on the possibility of side-tracking the whale by direct consumption of plankton (FOOD MANUFACTURE, February, 1941), some further data relating to the composition of plankton and its distribution in the sea may be of interest. According to the American scientist G. L. Clarke, reporting last year on the results of an expedition organised by the Woods Hole Oceanographic Institute, analyses of some typical catches of zooplankton revealed a content of 7 per cent. fat, 59 per cent. protein, 20 per cent. carbohydrate and 14 per cent. chitin and ash, the figures being based on the dry weight. The high protein content is a striking feature, particularly since we tend to think of plankton predominantly as a source of fat. A high protein content is apparently also a feature of the zooplankton in European waters, for two or three years ago reports came out of Germany that zooplankton was being considered as an *ersatz* for meat. Before we can eat our zooplankton, however, we must catch it, and this is where the snag arises, for no equipment yet exists for extracting really large quantities of these minute forms of life from sea-water. Up to recent times the method has been to spread large nets of suitable size mesh behind fishing craft, which were allowed to travel through the water at a rather low speed. Commercial catches are out of the question on these lines. It is calculated that a single adult might be able to exist on a daily ration of 750 grams plankton (dry weight), but even this relatively trivial quantity represents the catch from as much as 7,500 cubic metres of sea-water.

Examination of Lard

A valuable paper was read recently by R. W. Sutton, B.Sc., F.I.C., A. Barraclough, B.Sc., F.I.C., R. Mallinder, B.Sc., F.I.C., and O. Hitchen, B.Sc., F.I.C., at a meeting of the Society of Public Analysts and other Analytical Chemists. The reading of the paper was followed by a very complete discussion on the subject, in which many well-known chemists participated.

The authors pointed out the extraordinary variations which may occur in the major component fatty acids of lard according to the age of the pig, the character of the ration and such variations resulting in some highly abnormal figures for the analytical constants usually determined. Discussing the iodine value, the authors suggest that in some instances the upper limits of those proposed for average commercial lards should be increased. Whereas years ago an iodine value of 66 was rarely exceeded, figures as high as 69 and 70 are by no means uncommon to-day.

Commenting on the Bömer value, the authors said that in most of their work they used the procedure specified by the A.O.A.C., and that they had no reason to dispute the standards adopted, and they gave details of their analytical results.

Among other tests that were fully discussed was the detection of hydrogenated oils and fats, examination of sterols, and the microscopic examination of crystals. Professor T. P. Hilditch sent a written communication on the Bömer values.

The Melting Range of Fats

At a recent meeting of the Society of Public Analysts and other Analytical Chemists, among the papers that were presented and discussed was one by K. A. Williams, B.Sc., F.I.C., on "A Photo-electric Method for the Determination of the Melting Point of Fats", by which the present lack of consistency between the results of different observers using the capillary tube method may be avoided. The fact that melting starts at a temperature below the visual melting-point is confirmed by a modification of the dilatometric method which leads to reproducible and definite results for the true incipient and complete melting-points. The possible use of figures for change in volume on melting and for the rate of change of density with temperature during melting is suggested as a means of characterising fats.

"*Olive Oil*" *from Corn*

The consumption of all edible oils and fats in the United States is approximately 750,000,000 gal., of which 7,000,000 gal. are olive oil. Of this latter the California olive groves can produce approximately 300,000 gal. of edible oil, only about 4 per cent. of the country's requirements. In an article in November, 1940, *Food Industries*, it is declared that the apparent potential shortage of olive oil due to Great Britain's blockade in the Mediterranean need never become a reality, because of the process now used by American Maize-Products Co., based on Patents Nos. 2,069,265 and 2,199,364, assigned to Musher Foundation, Inc., New York.

This process, through infusion, imparts the odour and flavour of olive oil to highly refined, odourless, tasteless corn oil. Ripe olives, partially dehydrated by packing in layers of salt, are reduced to 20 per cent. moisture content. The olives are then ground, with or without pits, to a fine pulp in the presence of a small amount of corn oil. This paste is mixed with refined corn oil and passed through a colloid mill which brings the finely divided meat of the olive into intimate contact with the corn oil. The mixture is then filtered through a press to remove the undissolved olive solids.

This process not only produces an olive oil substitute high in carotene, which can supply the domestic demands for domestic-produced olive oil from California olives, but one which can be sold at a cheaper price.

Patent Law and Bacteria

If a research worker isolates a hitherto unidentified species of micro-organism and puts it to work to ferment carbohydrates to alcohol and other solvents, he may secure patent protection for the method of fermentation, but he cannot claim a monopoly of the organisms themselves. This principle has recently been affirmed in the American courts (*in re Arzberger*, U.S. Patents Quarterly, 1940, 32), which had to decide whether the micro-organism known as *Clostridium saccharobutyl-acetonicum* could be patented. The decision does not, of course, mean that breeders of organisms have no rights in patent law, for there is ample scope for novelty of subject-matter in connection with culture media, conditions of inoculation, the isolation of specific products from specific substrates and many other details. Thus, although Arzberger failed to obtain a patent for the organism which he isolated, he was able to protect his process for obtaining neutral solvents from sugar mashes with the aid of that organism. The patent literature on fermentation processes is actually of great dimensions. One of the landmarks in this field was the Weizmann patent (of 1915) relating to the production of acetone and butyl alcohol by decomposition of starchy carbohydrates with *Clostridium acetobutylicum*. This process was of incalculable importance at the time in providing a new source of essential raw materials. It also gave rise subsequently to litigation, but the point in dispute was the priority in exploiting the micro-organism, and this was settled in Weizmann's favour.

Publicity via Smell

We see that one of our contemporaries in America recently was printed with a perfumed printing ink to mask the smell of the ink, which is objectionable to some people. The smell of printing inks for foodstuff cartons has to be closely watched to avoid tainting the contents of the package. It appears that a new weapon has been placed in the hands of the publicity men. Not only can the product be coloured to produce a definite psychological reaction in its favour, but the printing ink for its wrappings can be made to support this appeal by way of the nose. What would be the effect on sales if a certain make of, for example, raspberry jam not only looked, but also smelt, delicious? It is doubtful, however, if the packers, say, of "Bombay Duck" would wax enthusiastic over this tentative suggestion.

"*When Doctors Disagree . . .*"

Hot upon the statements of Harris, Ireland and James on optimum calcium requirements which we quoted last month from their article in the *B.M.J.* come replies from Dr. R. A. McCance and Miss Isabella Leitch, both eminent students of mineral metabolism, and also a leading article in the same journal.

Dr. McCance, in a detailed criticism, says, "There are many features of the article to which serious exception must be taken", and concludes: "The results described in the article under criticism will carry no weight with the professional scientists until they have been repeated and confirmed by independent authorities. It is very much to be hoped that the public and the medical profession will take the same view."

Miss Leitch, of the Rowett Research Institute, also examines the findings of Harris *et al.*, and deduces that, "although from the results of their metabolism studies and clinical observations the writers may consider it advisable for certain adults to avoid a high calcium intake, they have produced no evidence that deficiency does not exist in the general population nor any of danger to normal subjects from such calcium intakes as are considered desirable.

The *B.M.J.*, in the leading article above referred to, gives a valuable review of the whole question with copious bibliographical references, which, indeed, also accompanied McCance's and Leitch's communications. Whatever may be the real truth of the matter, Dr. Harris and his colleagues have caused an excellent guide to the literature of calcium metabolism to become available to those interested.

At the moment of going to press we see that Dr. Harris has replied to his critics (*B.M.J.*, March 22), and sticks vehemently to his guns. We shall revert to this later.

Sugar Treatment

With the armament programme in full swing our supplies of bauxite have assumed a new significance, and news comes from America that this material has been found excellent for the treatment of sugar in the refining processes. W. A. La Lande (*Ind. Eng. Chem.*, 1941, 33, January, 108) finds that it is superior to bone char in that it produces filtrates of a higher purity. The reduction in ash content of the sugar is twice as efficient as with bone char and is especially striking, as also is the invert adsorption. Its high refining efficiency is maintained after repeated use, and the material is readily regenerated by heating for half an hour at 700° to 900° F. in the presence of air. The colour removal of bone char and bauxite are approximately equal, and the physical properties and handling of the suggested new adsorbant are not radically different from those of other adsorbants now used in the sugar industry.

National Honesty?

It is a brave man who tinkers with statistics in order to prove anything. This thought came to us while perusing a list of food prosecutions in December, issued by the Ministry of Food. The prosecutions are listed under the separate headings of England, Wales, Scotland and Northern Ireland, and the percentages of successful prosecutions are given. In England there were 93 per cent. successful prosecutions; in Wales 88 per cent.; in Scotland 98·2 per cent.; and in Northern Ireland 94·1 per cent.

We congratulate little Wales on its low score and turn with a stern eye on Scotland with its 98·2 per cent. However, the actual number of prosecutions are different in each case, which suggests abstruse and, by us, happily forgotten mathematical considerations, which would probably put the matter in a completely different light.

But seriously, the high percentages of successful prosecutions do show that these are not embarked upon frivolously by the authorities.

FOOD EXPORT IN WAR-TIME

R. J. TURNER, M.I.Ex.
(Chairman of the Institute of Export)

PROBABLY no section of our economic life is more surrounded by complexity, difficulty, control and outside interference than export trade. Certainly there is no more lucrative field for the agitator and the critic. To a large extent one may spring from the other, and yet close inspection of prevailing conditions reveals that neither, perhaps, could be entirely or even usefully abolished.

It is a further paradox that the inherent basis of export trade is so essentially one of the utmost simplicity. It amounts to nothing more than the exchange of those goods which we can best afford to allow to go out of the country for the goods which we are most anxious to acquire from other countries. The implications of that simple definition must be fully recognised and accepted if we are to appreciate properly the possibilities and limitations of export trade to-day.

All generalisations are dangerous, and perhaps nothing more so than attempting to speak to exporters as a class, even though there is much which is common to them all. But there is also a very great deal which is peculiar to each individual business. In the final analysis, therefore, it is for the individual exporter to determine for himself the application to his own business of general principles and conditions. It is no less important that he should assume a share of the responsibility for the formulation and acceptance of those principles and conditions.

"Export or Die"?

What every exporter likes to be told by those who presume to advise him is that there are markets definitely receptive of his goods, offering opportunities for trade expansion. There is no dearth of self-appointed advisers who seek to demonstrate that this is so, regardless of those considerations of higher policy which regulate our national economy to-day. It is often pathetic to find with what avidity the evidence is accepted, whereas clearly what is wanted is a lively appreciation by the exporter of all the factors and conditions to be taken into account and what gives rise to them. If that were present beforehand, instead of being bought afterwards in the hard and costly school of experience, what appears to be a negative condition may often be translated into a positive one. It is all a question of thinking for ourselves and, above all, of knowing for ourselves—of getting away from the old, bad habit of relying upon others to think for us. It is easy to take up the familiar parrot-cry of "Export or Die", and to look appealingly to others to prevent our demise. We are entitled to ask what are exporters themselves doing to influence and mould the conditions under which they must live and to ensure that they turn them to the most profitable advantage.

Export Trade Subservient to National Effort

Let us begin by recognising that we are at war, and that war, no less than peace, brings its opportunities. To refer to the vital importance of export trade has become so platitudinous that in some quarters it seems difficult to realise that it cannot overrule every other consideration. Export trade to-day is, must, and will be, subservient to the national war effort, and therefore moulded by Government policy to form a complementary and integral part of that effort. But it is important to remember that we are not alone in this war, that we are partners in the British Commonwealth of Nations. The Dominion and Colonial Governments have accordingly been obliged in the same way as we have to impose restrictions on consumption of non-essential goods, which means that this country's exports of such goods must clearly suffer. Nevertheless, those Governments, like our own, are also under the necessity of feeding a newly constituted war machine, which in itself must provide new opportunities.

Government Control

The need for Government control cannot come into question, and it is bound to be accompanied by restrictions which all too often prove both vexatious and incomprehensible to the new exporter. We cannot get away from them, but what we can do is to make ourselves thoroughly familiar with them and with the manner in which they impinge directly on our own particular business, so that we do not suffer because of ignorance or apathy. There is a responsibility upon all of us to get as close as we possibly can to official Government policy, so that we not only understand it, but also help to mould it and ensure that we take advantage of its facilities and scope—which are just as surely there as are the control and restrictions.

Loyal co-operation and intelligent interest is rightly expected from every exporter, but it would be a mistake to accept willy-nilly everything said or done by the authorities as necessarily being in the best interests of the national needs of to-day. We must concede that the Government should know better than anyone else the ultimate objective at which to aim. There are, however, so many different departments responsible for giving effect to official policy, and exercising the control it imposes, that we need not take it for granted that they are all perfectly familiar with the best method of attaining the objective. Even if they are, it is not beyond dispute that the right methods are not always used. As a matter of fact, on such grounds a good deal of criticism is rife at present. It is felt in many quarters that not only has the Government failed to make its policy crystal-clear for the benefit of the manufacturers whom it affects, but that there is also a serious lack of co-ordination amongst the various departments and other bodies responsible for giving effect to the policy laid down, and also in the diverse methods of applying the control it imposes.

The Export Drive

The enthusiasm with which exporters as a whole responded to the call for an export drive was a real tonic to the nation. They themselves were braced up by the belief that at long last official organisation was to be knocked into shape so as to give everybody having an article saleable abroad the right amount of encouragement and support to ensure that trade resulted. This belief was encouraged by the wholesale advice to manufacturers to form themselves into Trade Export Groups. It was accompanied by the formation of the Export Council, having as its declared object the promotion of overseas trade. Round about 300 groups are now in being—in itself an excellent achievement. With praiseworthy patience the country has awaited the results of this unprecedented regimentation of its exporting industries. It seems more than doubtful that any definite claim could be put forward that the excellent ideas behind this vast organisation have yet been, or are even likely to be, translated into action of the kind foreseen. On the contrary, it is not too much to suggest that the movement, taken as a whole, but with due allowance for certain notable exceptions, has been very largely stifled by a new official conception of the needs of the moment. Barely had manufacturers reached the peak of their enthusiasm and begun to clarify their ideas within their groups when there appeared—dimly at first, but latterly more pronounced—signs of a damping-down process. The indications are that this is about to emerge more clearly as a policy of Selective Exports.

Policy of Selective Exports

Allowing that the national needs of the moment must come first, can such a system in itself be criticised? Inevitably there must be many conflicting points of view. We are bound to come up against the old bugbear of export trade—the problem of reconciling personal interests with those of the country as a whole. But exporters at least have the right to expect some clear guidance and direction from the authorities upon the part which their own trades can and must play in the immense jigsaw of war-time economy. They should not be permitted to waste their time and money in trying to build up overseas business, only to find that all their efforts have been nullified by some variation of official policy which takes place meanwhile, and which more often than not first becomes known to them by the application of some previously unheard-of restriction or because certain necessary facilities are not to be had at the moment an order is booked for execution.

The policy of Selective Exports rests upon the effective prosecution of the war as the principal immediate aim. This calls for the most careful conservation of financial resources and productive capacity, in order that they may be devoted as fully as possible to the war effort. Labour, plant and productive capacity, where used in a way which does not directly help to win the war, must be diverted to channels through which they can make a direct contribution. That means the restriction of production and consumption of non-essential goods, not only for themselves, but also for Empire markets. The latter will clearly interfere with the trade of some British exporters, but, on the other hand, the intensive reorientation of world trade brought about by war conditions, with our own tremendous reliance upon overseas suppliers and the closing to them of their own normal sources of supply, must undoubtedly create many new opportunities for British exporters, of which they must take full advantage if our own essential import trade is to be maintained.

So we see what a complex situation arises, in which the need for an export drive and the conservation of our own resources play equal parts and have equal justification.

How are the Food Trades Affected?

How, then, are manufacturers of food-processing plant and equipment and such items of food as may be exported under war conditions likely to be affected? Their products are of prime need to overseas buyers, and least likely, therefore, to be affected by import restrictions. They promise to meet a prime need of our own—the return of food to this country. No system of selective exports or any other restraint is likely to be allowed to interfere with exports of this nature.

Strong Export Groups have been set up within the industry and officially recognised by the Export Council as representing makers of British equipment for the manufacture, preservation, handling, storage and preparation of every type of edible product, and for the exportation of certain foodstuffs. They are understood to be functioning smoothly and satisfactorily, principally in relation to the issuing of licences for raw materials needed for export trade. The Ministry of Supply, recognising the importance of the food industry and the valuable nature of the products manufactured by its members in relation to the export market, is said to be generous in its allocation of certain raw materials.. So again we see that the system of selective exports is definitely favourable both in theory and in practice to all associated with the food industry.

Practical Applications

It is easier, of course, to outline broad lines of policy and general conditions than to determine their practical application to each individual case. The exporter himself must appreciate that nothing can replace his own resourcefulness, his own determination and, above all, his expert knowledge of conditions, both in this country and the market to which he wishes to export. From the point of view of official backing, as we have seen, members of the Food Machinery Export Group would appear to be in a substantially more favourable position than exporters of other less essential commodities. So far as foodstuffs are concerned, it was decided a few months back to allow shipments to Colonial markets without an Export Licence. This eliminates one part of the form-filling and period of waiting to which most other exporters are subject. The concession illustrates the importance with which the industry is regarded officially, because, although many other exporters are subject to both export restrictions here and import restrictions at the buying end, it has been considered in the case of foodstuffs that import control alone in the Colonial Dependencies is sufficient safeguard.

Simplification of Procedure

This does not necessarily imply any fundamental change in the policy of the Ministry of Food in respect of supplies of foodstuffs to these Dependencies. It is intended solely as a simplification of procedure. Colonial Governments are informed by the Ministry of Food from time to time of the maximum quantities and kinds of particular foodstuffs which can be supplied from this country. According to their needs the Colonial authorities will issue Import Licences in the light of this information. The onus, of course, is upon the exporter to satisfy himself that his buyer has the requisite Import Licence. Except in special cases, such licences will not be issued for more than 100 per cent. of pre-war normal imports from the United Kingdom. Many exporters would be truly enviable of the prospect of working such an important group of markets up to the peak of their pre-war importing capacity. Of those commodities of which supplies are lower, imports must naturally be regulated at a lower level. The Food Manufacturers' Group, no doubt, is in a position to indicate to its members from time to time full details showing the degree of restriction operating. Colonial Governments, of course, will exercise their own discretion in the still further limitation of imports of any commodity if there are special local reasons for doing so.

Since this article was written a new Control Order has been issued by the Board of Trade which requires that export licences shall again be obtained for numerous specified foods and preparations for any destination abroad.

Membership of Export Groups

From which the desirability of membership of appropriate Export Groups will be appreciated so long as it is understood that this in itself cannot be expected to prove a panacea for all the ills which beset the exporter to-day. For all I know about them, the Food Machinery and Foodstuffs Groups may be outstandingly good examples of how the export drive should be conducted, but, taking them by and large, Export Groups are regarded as a great disillusionment and disappointment by many who felt justifiably that this system of regimentation would remove or make light of their difficulties.

Much, of course, depends upon whether the officials of the groups are themselves men of practical experience and knowledge in the realm of export. Generally speaking, there seems to be grave dissatisfaction on this point. Quite obviously, whatever other qualifications are demanded, the ability to appreciate exporters' everyday difficulties and problems, to know how to deal with and overcome them, to show an equal knowledge of the technique and practice of export, are indispensable requirements. It can hardly be claimed that group executives as a whole meet these essential requirements. The responsibility for this is not one which can be entirely disclaimed by exporters themselves.

The Working of Export Groups

Granted that the right type of executive has been chosen, experience of group working so far would suggest that there is something cumbersome about the whole system which has resulted in a great deal of confusion and irritation. There are many Export Groups whose interests interlock. Similarly, there are manufacturers who use in their finished products a wide variety of materials, the allocation of which involves a corresponding number of separate groups. It is not surprising that, if only on the score of expense alone, many exporters find it impossible to associate themselves with every relevant group. Passing higher up in the general scheme of things, we find that many groups must themselves be guided by numerous other authorities. Perhaps it is the Ministry of Supply or the Ministry of Food, or both, plus the Export Council and maybe one or more other Government departments. But the acquisition of raw materials for the goods to be exported, and necessary packing material, is often only the very first stage of a long and laborious procedure of deferring to official control. Before a shipment can be moved there are the regulations of the Board of Trade, the Treasury, the Export Licensing procedure to be observed, and finally it is the Ministry of Shipping which decides whether carrying space shall be available.

Manufacturers must Co-operate

On the other side of the picture the apathy and inexperience of certain manufacturers must certainly be shown as factors contributory to any failure there may be to give full effect to the export drive and its development in a fashion consistent with the war situation. These conditions are interdependent, but neither is excusable, whatever the provocation. Every manufacturer is charged with the national duty of developing overseas trade to the fullest extent possible consistent with national needs. It is understandable that many aspects of export policy must remain known only to the authorities themselves, but, withal, there is undoubtedly a readiness on their part to co-operate with the exporting community, to assist those who seek their advice, and to simplify procedure as far as may be compatible with the overriding needs of national security.

It is possible to dwell at very great length upon the complexities and difficulties which surround export trade to-day, and in some instances to regard them as almost insurmountable

barriers which it is not worth while to attempt to overcome. It is only right and proper that the exporter's troubles should be ventilated for the sake of bringing about whatever improvement may be possible. There is plenty of fertile soil in which the agitator and the critic may flourish, and on balance we may be grateful for their existence. Yet, in the final analysis, exporters must recognise that " it all depends on them ". Conditions as they exist must be clearly known, and, so far as they are not palpably redundant, accepted as inevitable, but not in the spirit that they are deliberate deterrents to trade, intended to discourage the exporter, but as something with which he must make himself familiar. It is his knowledge, his proficency, his experience in the current technique of export, which will prove his ability or otherwise for " delivering the goods ". And that, in my experience, is the crux of all export problems, whether in peace or in war—that export trade, being such a vital part of our economic machinery, has a technique of its own which must be acquired and mastered by all who wish for success.

Qualifications of an Exporter

It is easy for the expert to say, " There is a market for your goods." It is no less easy to quote this or that condition, to point to this or that financial or licensing regulation. The exporter himself must be capable of translating such information to practical advantage. He must be able to carry out scientific market research, to determine for himself where and how his goods may be disposed of to the best advantage. He must know the mentality, the temperament, the psychology, the habits, the preferences, the likes and dislikes of his potential customers, in addition to knowing the rules and regulations surrounding the importation of his goods in any country. He must be a politician without letting politics intrude in business; he must be a diplomat, a student of human nature, a practical business-man, and many other things besides. He must, in short, represent the best brains in the country, trained to the highest degree and kept the whole time at concert pitch.

All of this may sound rather idealistic, and there are probably few, if any, who possess such a list of qualifications. Most exporters, however, have some of them, and it will invariably be found that their deficiencies can be made good by contact with others. Export Groups have already done much to break down that traditional isolation which formerly characterised our exporters as a whole. It is, however, necessary to get still closer together, with the object of pooling our knowledge and resources for the common good. Conditions change far too rapidly for any one of us to be completely up to date all the time on every aspect of overseas trade. But what one does not know another will.

The Onus on Manufacturers

The onus is upon all manufacturers to do whatever they can to improve their proficiency in the technique of exporting, and none should be without a qualified executive whom they can regard as a specialist in his own particular calling, and be able to rely upon him in the same way as they would a member of any other profession, such as chartered accountants, for example. Unless manufacturers will do all they possibly can for themselves to guarantee their own ability, their knowledge and proficiency in the realm of export, they cannot expect the Government to be over-anxious to meet them or to modify the cumbersome procedure which is inseparable from export trade to-day.

LETTERS ON EXPORT FROM SOME LEADING MANUFACTURERS

The Editor.

DEAR SIR,

We are interested to note that you are putting forward a special Export Number of FOOD MANUFACTURE as your April issue. We shall be pleased to co-operate with you in any way in which you think we can help.

You will probably realise that, as far as export trade is concerned, we, in common with many other engineering firms connected with the food and allied trades, find that export is difficult owing to war conditions. In view of big Government commitments from many departments, we find it difficult to keep normal trade going. Export trade taking such a high priority as it does, we naturally do our very best to comply with the Government's wishes and to fulfil the requirements of our agents and customers abroad. We impress the fact upon our agents of the difficulties under which we are working, but the enquiries which we receive from abroad, no matter how small, are having our very best attention.

We are, of course, dealing with and endeavouring to assist the various Export Groups of which we are members (in fact, one of which our Managing Director is Chairman) to the best of our ability, and on the lines under which our general run of productions fall, but, of course, you will appreciate that, as we have already stated, one of the problems at the present time is having to divert practically the whole of our business to urgent war orders.

Yours sincerely,

FRANK C. GARDNER,
Director
(Wm. Gardner and Sons [Gloucester], Ltd.)

The Editor.

DEAR SIR,

There is little doubt that exports are a very important part of our war effort, inasmuch as they supply us with foreign exchange; and the Government appears to be fully alive to that fact. It would seem important, with a view to getting the maximum return for a given effort, that there should be a certain amount of selection; for instance, exports which bring in the greatest amount of foreign currency for the minimum amount of those materials of which we are shortest should obviously be specially encouraged. Exports to certain countries are of more use than exports to others, for the return which they bring, and exports on certain shipping routes are also more convenient, as there are countries from which we import largely and have ships going back perhaps not fully loaded. We believe that the Government is fully alive to all these facts also, but the process of selection must be somewhat difficult to arrange, and no doupt will have to be left to some extent to the good sense of individual firms.

To make sure that firms able to obtain and carry out export orders do not go short of materials, the Government has caused to be formed a number of Export Groups covering the whole field of industry. On the whole these groups seem to be functioning well, and the materials for export orders appear to be available when required, or within a little of the time required, to the firms who are members of a group. One does sometimes wonder, however, if the determination of the Government to encourage exports, and the evidence of it given by this group system, is sufficiently publicised overseas. There is no doubt that one of the factors acting against our export business is the feeling in some countries that under war conditions we cannot deliver the goods, or at any rate that the delivery time will be far too long. It would help to dispel this feeling if through the representatives overseas of the Department of Overseas Trade, or otherwise, it could be made clear in the countries concerned how determined the Government is that materials will always be available to British firms for export orders. The other factor we have got to get over is the difficulty of quoting firm prices. This difficulty, however, is now more or less worldwide, but at the same time, if we could in any way elaborate some scheme for enabling firms to quote firm prices, or prices variable only within certain limits, for such things as machinery, which take time to make, it would be a big asset to us.

W. S. DOUGLAS,
Managing Director
(William Douglas and Sons, Ltd.).

The Editor.

DEAR SIR,

With reference to your Export Number in April, we as makers are unfortunately not permitted by the Board of Trade to receive export licences for pectin to South America.

As a matter of interest we are unable to see any reason for this, but you may doubtless be aware that little or no notice of any arguments from the manufacturer's point of view is taken by Government officials these days.

Yours faithfully,
For WILLIAM EVANS AND CO. (HEREFORD AND DEVON), LTD.
W. R. BUFTON,
Director.

FOOD MACHINERY AND CHEMICAL PLANT EXPORT GROUP

NORMAN NEVILLE

EARLY in 1940 H.M. Government determined upon the co-ordination of the export trade of the country not only to promote, as a vital contribution to the war effort, the greatest possible volume of export trade consistent with service requirements, the shipping facilities available and other conditions arising out of the war, but also to prepare for the possibly more critical and testing conditions that might arise in the export field after hostilities have ceased.

To give effect to this decision the Government constituted the Export Council of the Board of Trade under the chairmanship of the President of the Board of Trade. Representative as it is of leading export interests and of the Government Departments concerned, the Export Council provides a valuable link between Government and Industry.

The Export Council lost no time in drawing up a far-reaching programme, particulars of which were issued in a White Paper (No. C.M.D. 6183), in accordance with which all manufacturers of exportable goods were required to form themselves into Export Groups, each Group being concerned with a particular trade.

The response was immediate, and, with the guidance and assistance of the Export Council, upwards of three hundred Export Groups have now been formed, covering practically the whole export trade of the country.

A number of separate Export Groups were formed by various sections of the industry concerned with the equipment of food and chemical works and, at the instance of the technical advisers of the Government, the Export Council took the initiative in bringing together the several Groups in question and urged them to join together to form a Composite Group which, with its wider scope and greater resources, would be in a strong position more intensively to develop the export trade of its members and would be able more successfully to combat foreign competition after the war.

At first the Export Groups concerned were somewhat reluctant to sink their identities in a larger organisation, but the cogency of the Export Council's arguments could not be ignored, and, after a series of conferences and in close collaboration with the Export Council, a Composite Group was constituted under the name of the Foods and Chemicals Processing Machinery Export Group. The name has since been changed to the Food Machinery and Chemical Plant Export Group.

Original Groups become Sub-Groups

The Original Groups thus became Sub-Groups of the Composite organisation which now embraces the following:

Bakery and Biscuit Plant Export Group.
Brewing and Mineral Water and Allied Plant Export Group.
Chemical Plant Export Group.
Chocolate and Sugar Confectionery Machinery Export Group.
Dairy Equipment Export Group.
Food Machinery and Chemical Plant (Misc.) Export Group.
Paint, Ink and Allied Trades Machinery Export Group.

Experience since the formation of the Composite Group has fully justified the Export Council's action in urging this amalgamation of interests, and it is likely that other Groups in or allied to the industry will find it in their best interests to join forces with the Composite Group.

The chairman for the current year is Mr. E. H. Gilpin, director of Messrs. Baker Perkins, Ltd., of Peterborough, who, owing to his intimate acquaintance with overseas markets and export trade problems and his close contacts in Government circles, is eminently qualified to occupy that position.

Functions of the Group

One of the most important of the immediate functions of the Group is the distribution, on behalf of the Industrial Supplies Department of the Board of Trade, of the steel, timber, and other supplies required by the members for their export orders. In view of constantly changing conditions, this distribution of raw materials is becoming a matter of increasing importance and complexity, for it is essential so to direct exports that they contribute to the utmost possible extent to the war effort after taking into full consideration the demands on material, productive capacity and labour for service requirements, the financial position of overseas markets and limitations of shipping space.

So as to obviate non-productive effort in quoting against enquiries for goods or from markets which cannot in existing circumstances be supplied, and to avoid disappointing overseas customers by making promises that may not be fulfilled, members are advised by the Group which enquiries it would be best to concentrate upon.

For this purpose the Group has instituted a system whereby members register all their export enquiries with the Group, and this also provides a means of ensuring that if one member, owing to preoccupation with service requirements, cannot supply the goods enquired for, other members have the opportunity of quoting.

Enquiries for Complete Processing Plants

Many of the overseas enquiries received by members of the Group are for complete plants for the processing of a variety of foods and chemicals. Hitherto, such enquiries, which are frequently issued broadcast, have often been dealt with by several members in competition, thus resulting in duplication of effort and, from the national point of view, considerable waste of expenditure of time and money on the preparation of similar projects.

The industry as a whole includes an immense amount of specialised knowledge on practically every phase of food and chemical processing, and in future it is proposed to pool this experience and, by dealing with such projects on a co-operative basis, to put forward composite tenders, thus presenting a united front to foreign competition.

The conduct of export business under war conditions gives rise to many other problems, and the advice and assistance of the Group is in frequent demand in connection with such questions as deliveries of raw materials and components, shipping and finance.

Long-Term Activities

Amongst the longer term activities of the Group is the study of potential markets for members' products in overseas countries with a view to assessing their relative importance so as to concentrate, when conditions permit, on those markets most likely to repay special attention, in which connection it is hoped, in certain markets, to organise co-operative selling organisations so as to secure more effective representation than hitherto.

It is also proposed, when members can fully resume their export trade, to initiate a system of co-operative publicity so as to reach all important potential buyers in the overseas markets.

Close contact is being maintained with the various Government Departments concerned with overseas trade not only to facilitate the solution of members' immediate problems, but also bearing in mind the possibility of effective group action in connection with marketing, quota or similar schemes that may arise in the course of the post-war settlement of international difficulties.

Composition of Group

EXECUTIVE COMMITTEE

CHAIRMAN

Mr. E. H. Gilpin (*Baker Perkins, Ltd.*).

VICE-CHAIRMAN

Dr. R. Seligman (*Aluminium Plant and Vessel Co., Ltd.*).

Bakery and Biscuit Plant Export Group

Mr. L. H. King (*Baker Perkins, Ltd.*).

Brewing and Mineral Water Machinery and Allied Plant Export Group

Mr. F. E. Howard (*Hayward-Tyler, Ltd.*).
Capt. A. P. L. Blaxter (*Barnett and Foster, Ltd.*).

Chemical Plant Export Group

Dr. R. Seligman (*Aluminium Plant and Vessel Co., Ltd.*).
Mr. B. L. Broadbent (*Thos. Broadbent and Sons, Ltd.*).

Chocolate and Sugar Confectionery Plant Export Group

Mr. F. H. Plaistowe (*Baker Perkins, Ltd.*).
Mr. L. A. Moody (*Brierley, Collier and Hartley, Ltd.*).

Dairy Equipment Export Group

Mr. E. A. Shepheard (*U.D. Engineering Co., Ltd.*).
Mr. A. Graham Enock (*Graham Enock Mfg. Co., Ltd.*).

Paint, Ink and Allied Trades Machinery Export Group

Mr. C. E. Carruthers (*Torrance and Sons, Ltd.*).
Mr. J. T. Burslem (*Secretary*).

DIRECTOR AND SECRETARY

Mr. Norman Neville,
57, Victoria Street, London, S.W. 1.
Telephone: Abbey 6648.

MEMBERS

Bakery and Biscuit Plant Export Group

SUB-GROUP COMMITTEE

Mr. L. H. King (*Baker Perkins, Ltd.*), *Chairman.*
Mr. T. B. Collins (*Thomas Collins and Co., Ltd.*).
Mr. A. W. Dumbrill (*Dumbrill Plant and Eng. Co., Ltd.*).
Mr. G. W. F. Grainger (*T. and T. Vicars, Ltd.*).
Mr. J. A. Pelkman (*Pelkman Bros.*).
Mr. C. M. C. Symes (*United Yeast Co., Ltd.*).

LIST OF MEMBERS

Baker Perkins, Ltd., Peterborough.
Thomas Collins and Co., Ltd., St. Werburgh's Road, Bristol, 1.
James Cruickshank, Ltd., Duff Street, Edinburgh.
Dumbrill Plant and Eng. Co., Ltd., Beddington Lane, Croydon.
C. O. Ericsson Eng. Works, Ltd., King's Norton, Birmingham.
Mumidor, Ltd., 1, Radnor Mews, Paddington, W. 2.
John Hunt (Bolton), Ltd., Bolton, Lancs.
Kent and Co. (Globe Works), Ltd., Southern Grove, E. 3.
W. F. Mason, Ltd., Mona Works, Levenshulme, Manchester.
Melvin and Gillespie, Ltd., St. Rollox Ironworks, Glasgow.
The Morton Machine Co., Wishaw, Scotland.
Pelkman Bros., 161, Cheapside, E.C. 2.
Peerless Electric Mfg. Co., Ltd., Carlyle Road, The Hyde, Hendon.
Sorenson Bakery Equipment, Ltd., 254, Stretford Road, Manchester, 15.
The United Yeast Co., Ltd., 240, City Road, E.C. 1.
T. and T. Vicars, Ltd., Earlestown, Newton-le-Willows.

Brewing and Mineral Water Machinery and Allied Plant Export Group

SUB-GROUP COMMITTEE

Mr. F. E. Howard (*Hayward-Tyler and Co., Ltd.*), *Chairman.*
Capt. A. P. L. Blaxter (*Barnett and Foster, Ltd.*).
Mr. R. W. Drury (*Enamelled Metal Products Corp.* [1933], *Ltd.*).
Mr. R. Worssam (*G. J. Worssam and Sons, Ltd.*).

LIST OF MEMBERS

Barnett and Foster, Ltd., 26, Eagle Wharf Road, N. 1.
Bratby and Hinchliffe, Ltd., Sandford Street, Ancoats, Manchester.
Enamelled Metal Products Corp. (1933), Ltd., Artillery House, Artillery Row, S.W. 1.
Gimson and Co. (Leicester), Ltd., Vulcan Road, Leicester.
Hayward-Tyler, Ltd., Luton, Beds.
Thomas Hill Eng. Co., Ltd., 247, Beverley Road, Hull.
Liquid Carbonic Co. Ltd., Shell-Mex House, Victoria Embankment, W.C. 2.
Meadowcroft and Sons, Ltd., Regent Street, Blackburn, Lancs.
Meyer-Dumore Bottlers' Equipment, Ltd., Abbey Road, Park Royal, N.W. 10.
R. Powley and Son, Ltd., St. Mark's Road, Sunderland.
R. and W. Webster and Co., Ltd., Abbey Ironworks, Waltham Cross.
G. J. Worssam and Son, Ltd., Wenlock Road, City Road, N. 1.

Chemical Plant Export Group

SUB-GROUP COMMITTEE

Dr. R. Seligman (*Aluminium Plant and Vessel Co., Ltd*), *Chairman.*
Mr. B. L. Broadbent (*Thos. Broadbent and Sons, Ltd.*).
Mr. N. Fraser (*W. J. Fraser and Co., Ltd.*).
Major V. F. Gloag (*Simon-Carves, Ltd.*).
Mr. H. G. Edmunds (*Baker Perkins, Ltd.*).
Mr. J. MacGregor (*George Scott and Son* [*London*], *Ltd.*).
Mr. J. A. Reavell (*Kestner Evaporator and Eng. Co., Ltd.*).
Mr. W. A. Williams (*British Chemical Plant Manufacturers' Association*).

LIST OF MEMBERS

Alfa-Laval, Ltd., Great West Road, Brentford, Middlesex.
Ashmore Benson Pease and Co., Ltd., Stockton-on-Tees.
Aluminium Plant and Vessel Co., Ltd., Point Pleasant, Wandsworth, S.W. 18.
Baker Perkins, Ltd., Peterborough.
Henry Balfour and Co., Ltd., Leven, Fife.
Bennett Sons and Shears, Ltd., 9-13, George Street, W. 1.
S. Briggs and Co., Ltd., Burton-on-Trent.
British Oxygen Co., Ltd., Grosvenor House, Park Lane, W. 1.
Thos. Broadbent and Sons, Ltd., Huddersfield.
J. Harrison Carter, Ltd., Dunstable.
T. and C. Clarke and Co., Ltd., Shakespeare Foundry, Wolverhampton.
Doulton and Co., Ltd., Lambeth, S.E. 1.
W. J. Fraser and Co., Ltd., Dagenham, Essex.
Fullerton, Hodgart and Barclay, Ltd., Vulcan Works, Paisley.
Hathernware, Ltd., Hathern Station Works, nr. Loughborough.
W. C. Holmes and Co., Ltd., Turnbridge Foundry, Huddersfield.
Huntington, Heberlein and Co., Ltd., Upper Downing, Whitford, nr. Holywell.
Industrial Waste Eliminators, Ltd., Cambridge House, Hitchin Street, Baldock, Herts.
International Combustion, Ltd., 19, Woburn Place, W.C. 1.
International Electrolytic Plant Co., Sandycroft, Chester.
S. H. Johnson and Co., Ltd., Carpenters Road, E. 15.
Kestner Evaporator and Eng. Co., Ltd., 5, Grosvenor Gardens, S.W. 1.
Lennox Foundry Co., Ltd., Glenville Grove, S.E. 8.
Manesty Machines, Ltd., Speke Hall Road, Liverpool, 19.
Metafiltration Co., Ltd., Hounslow, Middlesex.
Metal Propellers, Ltd., Purley Way, Croydon.
Wm. Neill and Sons, Ltd., St. Helen's Junction, Lancs.
Newton Chambers and Co., Ltd., Thorncliffe, nr. Sheffield.
Oxley Engineering Co., Ltd., Clarance Road, Hunslet, Leeds, 10.
Pascall Engineering Co., Ltd., 156, Charing Cross Road, W.C. 2.
George Scott and Son (London), Ltd., Artillery House, Artillery Row, S.W. 1.
Sharples Centrifuges, Ltd., Hillgrove, Woodchester, Stroud.
Simon-Carves, Ltd., Cheadle Heath, Stockport.
Sutcliffe, Speakman and Co., Ltd., Leigh, Lancs.
John Thompson (Dudley), Ltd., Windmill Works, Dudley.

Chocolate and Sugar Confectionery Machinery Export Group

SUB-GROUP COMMITTEE

Mr. F. H. Plaistowe (*Baker Perkins, Ltd.*), *Chairman.*
Mr. F. C. Gardner (*Wm. Gardner and Sons* [*Glos.*], *Ltd.*).
Mr. L. A. Moody (*Brierley, Collier and Hartley, Ltd.*).
Mr. J. Allen Goddard (*Low and Duff, Ltd.*).

LIST OF MEMBERS

Baker Perkins, Ltd., Peterborough.
Norman Bartlett, Ltd., Upper Ground, S.E. 1.
Brierley, Collier and Hartley, Ltd., Sentinel House, Southampton Row, W.C. 1.
Forgrove Machinery Co., Ltd., Dewsbury Road, Leeds, 11.
W. Gardner and Sons (Gloucester), Ltd., Gloucester.
Low and Duff, Ltd., Monifieth, County Angus.
Rose Bros. (Gainsborough), Ltd., Albion Works, Gainsborough.

Dairy Equipment Export Group

SUB-GROUP COMMITTEE

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Mr. F. Clark (*Cherry-Burrell, Ltd.*).
Mr. A. Graham Enock (*Graham Enock Mfg. Co., Ltd.*).
Mr. J. W. Wilson (*Aluminium Plant and Vessel Co., Ltd.*).
Dr. H. B. Cronshaw (*"Dairy Industries"*).

LIST OF MEMBERS

Alka, Ltd., Minerva Road, N.W. 10.
Aluminium Plant and Vessel Co., Ltd., Point Pleasant, S.W. 18.
Bertrams, Ltd., Sciennes, Edinburgh.
J. J. Blow, Ltd., 5, Hardwick Street, E.C. 1.
British Miller Hydro Co., Ltd., Trading Estate, Slough.
Cherry-Burrell, Ltd., Power Road, W. 4.
George S. Clayton, Ltd., St. Anne's Works, E. 15.
Creamery Package Mfg. Co., Ltd., Avery House, Clerkenwell, E.C. 1.
Dairy Supply Co., Ltd., Cumberland Avenue, N.W. 10.
Dawson Bros., Ltd., Ventnor Works, Gomersal.
Graham Enock Mfg. Co., Ltd., Windus Road, N. 16.
G. Hopkins and Son, Ltd., 40, Holloway Road, N. 7.
Lawrence and Co., Ltd., 132, Latimer Road, W. 10.
Metal Propellers, Ltd., Purley Way, Croydon.
Nathans Sales, Ltd., 79A, Copenhagen Street, N. 1.
Thompson Bros. (Bilston), Ltd., Bilston.
U.D. Engineering Co., Ltd., Cumberland Avenue, N.W. 10.
Vipan and Headley, Ltd., Abbey Gate, Leicester.
R. and W. Webster, Ltd., Abbey Ironworks, Waltham Cross.

Paint, Ink and Allied Trades Machinery Export Group

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Mr. H. W. Butler (*Buhler Bros.*).
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Mr. G. Steele (*Steele and Cowlishaw*).
Mr. R. Worssam (*Brinjes and Goodwin*).

LIST OF MEMBERS

Barker and Aspey, Ltd., 138, Cleveland Street, Hull.
Brinjes and Goodwin, Wenlock Road, N. 1.
Buhler Bros., 9-11, Lavington Street, S.E. 1.
Cox's Paint Machinery, Ltd., St. Thomas's Street, Bristol, 1.
Holmes Bros (Paint Machinery), Ltd., 66, Victoria Street, S.W. 1.
Keenok Co., Ltd., Warton Road, E. 15.
Marchant Bros., Ltd., 60, Verney Road, S.E. 16.
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FOOD MACHINERY FOR SOUTH AMERICA

The author of this article, H. GORDON LAWSON JOHNSTON, Chairman of the British and Latin American Chamber of Commerce, briefly discusses the food machinery export trade to the countries he knows as a result of many years' personal experience. He writes mainly from the angle of post-war developments.

THE 1914-1918 conflict made a good proportion of the importers of canned and bottled foods in South American countries realise the necessity to develop their own national industries, and in this respect the Argentine Republic and Brazil may be specially mentioned.

Before 1914

Before 1914 the agents of British-manufactured canned and bottled goods, as well as jams, biscuits and the like, found little difficulty in obtaining constant and substantial orders for them. The same applied to what might be termed " luxury goods ".

During the war period, and more especially during the latter part of it, imports of goods of the nature mentioned were restricted to such an extent that they were difficult to obtain from the United Kingdom.

In the meantime South American countries were growing rich from the sale of their wheat, meat, hides and tallow, shipped at high prices to Europe for the account of the Allies. It was natural that this situation caused the Argentine and Brazil to study and develop the manufacture of food commodities at home, especially in view of the superabundance of cattle, fruit and vegetables ready for the can or bottle, as well as the raw materials for other foodstuffs.

The industry was very soon in a thriving condition, especially as the governments concerned gave all manner of support to what is to-day, in the well-known phrase, the *Industria National*. Every container of foodstuffs made in the country bears this mark.

Many large British exporters of foodstuffs to South America, as well as those of other countries, have long since started their own factories in the republics. In the Argentine perhaps the most striking activity has been in jam manufacture and fruit packs, rendered easier by reason of the large crop of cane sugar which is produced in the country itself. As regards luxury packing of fancy meats, the large meat works had already been there for some time with their vast plants working for export. These were able to keep the local market well supplied.

Food Machinery

It can be understood, therefore, that there must be a large and ever-increasing field for food machinery in South America. It is true that for the moment production may have to be curtailed owing to the difficulty of obtaining tinplate, so far as the canning industry is concerned. Incidentally, it may be mentioned that Welsh tinplate, by reason of its high standard of quality, has become almost a household word among South American canners.

In looking to these important markets it is necessary to visualise the certainty of severe competition, especially from the United States, where the canned and bottled food industry is so powerful that it can afford to spend enormous sums of money on research work, and where new models and new systems of plant and equipment are brought out almost yearly.

The Agent or Representative

Upon the efficiency of agents or branch representation depends most of the success in the building up and continuance of a food manufacturer's business in the countries under discussion. If the manufacturer is in a position to establish his own representation, it is most important that he should send out a first-class technical man with a full knowledge of the equipment he is to handle and also its lay-out. Although perhaps not absolutely essential, it is preferable that he be familiar with the Spanish language (or, in the case of Brazil, Portuguese). He will find on the other side an intelligent, co-operative staff, South American born.

It is essential for the manufacturer to have his own workshops or to enter into negotiations with a firm of standing which would handle all erection and fitting of plant. Furthermore, an ample supply of spare parts for the repair of equipment should be available; in other words, the manufacturer's service should be such as not to let his customer down in any particular.

If a particular export business does not justify a representation, it is necessary to ensure that firms of reputable engineers and machinery merchants be chosen. The manufacturer would have his own engineer—a specialist in the particular equipment supplied—who would supervise the mechanics and fitters who erect the plant, these mechanics and fitters being supplied by the machinery merchants.

In some cases representatives of South American food manufacturers come to this country to buy machinery. When this happens it is good policy for the machinery manufacturer to communicate at once with his branch or agent on the other side, as this will encourage him and assure him that full co-operation is being maintained on this side. It is also advisable to ensure that orders for plant and equipment are placed with the agent, while giving an assurance to the visiting buyer that, in the event of an order being placed, the branch or agent will be responsible for the maintenance and servicing of the plant.

Advertising and Publicity

Advertising and publicity should be left entirely in the hands of the representative or agent in the country concerned. Copies of catalogues and leaflets in the English language should be sent out, with blocks and/or photographs illustrating the items of plant, in order that the correct translations into technical Spanish or Portuguese may be made.

For many years there has existed the desire to purchase plant and equipment from British manufacturers, owing to its high standard of quality and perhaps also to the fact that we are their best customers. It must not be ignored, however, that in the future the competition from other countries is likely to be greater than ever, and the question of price must be carefully borne in mind. Full and constant reports of what competitors are doing, especially with regard to their prices, should be forthcoming from the manufacturers' representatives on the other side.

A further important point is the question of deliveries, and sometimes good orders are lost from a disregard of this.

I have often felt that a combination of British food machinery manufacturers, not necessarily making the same competitive plant, working under the direct management of a technical food machinery consultant, would be able to establish a firm standing in South American countries.

In the United States there are many important firms of food and packing-house consultants who have a full knowledge of plant and machinery lay-out and the necessary type of building for housing it. Even the largest packing plants employ such firms despite the fact that they themselves have their own technical staffs.

Close touch should be kept with the representative or agent. They should be brought home from time to time, and the manufacturer should also make periodical visits to them. A round-table talk on the many questions which may have arisen since the last meeting will save months of exchanging letters and cables.

It should be borne in mind that the demand, especially in the Argentine, is for all classes of food machinery, but it should also be remembered that they know what they are buying.

The food journals should be constantly read, not only by the heads of manufacturing firms, but by their staffs, and to that end more than one copy should be ordered.

All these points help the manufacturer in the study of prospective markets and, if they are already working in them, to keep up to date in regard to them.

To-day metal is going to the furnaces for war material, but once peace is restored the manufacturers of food machinery, like those of any other class, must be in the immediate position to enter every possible market abroad. Hence, so far as possible under the circumstances, a long-term policy should be envisaged.

The British nation has always been one with inventive genius, and this should be utilised to the utmost extent in furthering the progress of British trade. The opportunity will come at the end of hostilities because the output of machinery has had to be reduced, and consequently the need for replenishing plant will be very great.

THE FOOD INDUSTRY IN ARGENTINA

According to the statistics for 1937, the position of the food industry in Argentina compared with total figures for industry in the country was as follows :

It will be observed that the food industries group is the largest and most important in Argentina.

The table which is given below, taken from the official figures

TABLE 1

Industrial Groups.	*No. of Establishments.*	*No. of Employees and Workmen.*	*Salaries and Wages Paid. (m$n.*)*	*Raw Materials Employed. m$n.*	*Processed Products. m$n.*
		%	%	%	%
Total for the Republic	100·0	100·0	100·0	100·0	100·0
Foodstuffs, beverages and tobacco ..	26·3	21·0	21·1	46·9	37·2
Textiles and manufactures	12·8	15·4	16·0	15·3	14·1
Forestry products and manufactures ..	9·4	6·1	4·4	2·2	3·0
Paper, cardboard and manufactures ..	0·5	1·5	1·1	1·0	1·0
Printing, publications and allied ..	4·8	4·7	6·0	1·8	3·7
Chemical and pharmaceutical substances and products, oils and paints	2·5	3·2	3·2	4·5	3·8
Petroleum, coal and derived products	0·1	0·7	1·0	4·8	3·6
Rubber and manufactures	0·1	0·9	0·7	0·9	0·8
Leather and manufactures	2·7	3·2	3·2	3·1	2·8
Stone, earths, glass and ceramics ..	5·7	3·8	3·1	1·2	2·3
Metals and manufactures, excluding machinery	8·1	8·1	7·5	5·7	6·1
Electrical works	1·9	2·9	4·6	—	4·7
Machinery and vehicles	15·2	10·1	11·7	6·8	7·7
Building works	4·5	8·5	6·8	4·0	5·0
Oilfields, quarries and mines	0·4	2·3	2·5	0·0	1·3
Sundry	4·9	7·6	7·0	1·7	2·9

* m$n = Argentine paper pesos.

TABLE 2

Industries.	*No. of Establishments.*	*No. of Employees and Workmen.*	*Salaries and Wages Paid. (m$n.)*	*Raw Materials Employed. m$n.*	*Processed Products. m$n.*
Butter, cheese and other milk products	1,249	7,587	9,235,831	87,795,044	112,669,136
Fish, shell fish, etc. (preserved) ..	23	364	331,551	1,116,911	1,721,540
Ice-cream	223	971	426,246	1,838,697	2,874,965
Meats, elaboration of, including chilled and frozen meats	21	28,532	50,408,907	427,303,174	528,201,658
Preserved meats (packed, etc.) and edible fats not made in freezing establishments	280	1,913	2,688,344	17,896,045	23,640,058
Bread and other bakery articles ..	5,548	25,005	33,716,309	124,410,746	186,167,920
Fruits and vegetable preserved and dried, jams, condiments, etc. ..	148	2,280	2,854,732	17,329,051	22,420,260
Chocolate and its products, caramels, pastilles, etc., not made in confectioneries or bakeries	177	5,587	6,200,014	21,881,100	30,781,104
Coffee toasted and ground	160	1,317	1,944,630	20,319,643	23,831,258
Pastries, sandwiches and similar articles not made in bakeries or factories of similar products	383	1,978	2,699,168	5,523,675	10,065,488
Vegetables and cereals in the form of flours and other preparations ..	101	562	660,502	6,100,028	7,564,694
Flour and other products of wheat mills	216	6,199	10,534,656	237,245,654	258,002,410
Macaroni and similar pastes—fresh and dried	541	5,578	5,750,364	27,499,480	37,774,027
Rice, polishing, grinding and other operations	20	373	664,602	17,026,218	18,998,059
Edible oils; elaboration and packing ..	87	3,095	5,242,074	71,026,211	81,617,233
Sugar	41	6,570	13,747,634	63,244,216	107,510,896
Maté tea grinding and packing ..	63	2,978	4,327,459	29,592,014	36,507,918
Dietetic products	3	81	98,258	167,150	324,916
Biscuits	49	2,996	2,919,021	7,818,256	11,786,450
Honey; preparation and packing ..	27	57	53,030	230,172	311,640
Liqueurs, other alcoholic beverages and soft drinks	85	1,959	3,144,310	27,050,058	32,486,848
Vinegar	20	198	276,915	513,353	1,064,674
Wine-making establishments (stores)	1,777	6,085	9,632,598	40,590,884	54,796,391
Beer	19	4,695	7,918,190	11,255,287	37,292,699
Wines (bottling)	170	2,630	4,197,327	33,821,640	38,126,979
Aerated waters and drinks without alcohol	1,361	4,908	6,219,117	5,826,555	15,240,782
Miscellaneous	34	1,124	2,093,398	10,187,333	15,347,173

LA INDUSTRIA DE LOS ALIMENTOS EN LA REPUBLICA ARGENTINA

De acuerdo a las cifras del año 1937 la posición de la industria alimenticia en la República Argentina, en comparación con el total de la industria en el pais, era la siguiente (Cuadro 1):

Como puede verse el grupo de las industrias alimenticias es el principal y más importante en la Argentina.

El cuadro que damos a continuación, tomado de las cifras

CUADRO 1 ·

Grupos de Industria.	*No. de establecimientos.*	*No. de empleados y obreros.*	*Sueldos y salarios pagados. (m$n.)*	*Materias primas empleadas. m$n.*	*Productos elaborados. m$n.*
	%	%	%	%	%
Total de la República	100·0	100·0	100·0	100·0	100·0
Substancias ailmenticias, bebidas y tobaco	26·3	21·0	21·1	46·9	37·2
Textiles y sus manufacturas	12·8	15·4	16·0	15·3	14·1
Productos forestales y sus manufacturas	0·4	6·1	4·4	2·2	3·0
Papel, carton y sus artefactos ..	0·5	1·5	1·1	1·0	1·0
Imprenta, publicaciones y análogos ..	4·8	4·7	6·0	1·8	3·7
Substancias y productos químicos y farmaceúticos, aceites y pinturas ..	2·5	3·2	3·2	4·5	3·8
Petróleo y carbón y sus derivados ..	0·1	0·7	1·0	4·8	3·6
Caucho y sus manufacturas	0·1	0·9	0·7	0·9	0·8
Cuero y sus manufacturas	2·7	3·2	3·2	3·1	2·8
Piedras, tierras, vidrios y cerámica ..	5·7	3·8	3·1	1·2	2·3
Metales y sus manufacturas, exclusive maquinaria	8·1	8·1	7·5	5·7	6·1
Fábricas de electricidad	1·9	2·9	4·6	—	4·7
Maquinaria y vehiculos	15·2	10·1	11·7	6·8	7·7
Empresas de construoción	4·5	8·5	6·8	4·0	5·0
Yacimientos, canteras y minas ..	0·4	2·3	2·5	0·0	1·3
Varios	4·9	7·6	7·0	1·7	2·9

CUADRO 2 ·

Industrias.	*No. de establecimientos.*	*No. de empleados. y obreros.*	*Sueldos y Salarios pagados. (m$n.)*	*Materias primas empleadas. (m$n.)*	*Productos elaborados. (m$n.)*
Manteca, queso, y demás productos de lechería	1,249	7,587	9,235,831	87,795,044	112,669,136
Pescados mariscos, etc., en conserva	23	364	331,551	1,116,911	1,721,540
Helados	223	971	426,246	1,838,697	2,874,965
Carnes, elaboración incluyendo la matanza de reses (frigorifico) ..	21	28,532	50,408,907	427,303,174	528,201,658
Carnes conservadas, embutidos y similares y grasas comestibles; no elaborados en frigorificos	280	1,913	2,688,344	17,896,045	23,640,058
Pan y otros articulos elaborados en panaderias	5,548	25,005	33,716,309	124,410,746	186,167,920
Frutas y legumbres, secas y en conserva, dulces, condimentos, etc ..	148	2,280	2,854,732	17,329,051	22,420,260
Chocolate y sus productos, caramelos, pastillas, turrones, etc., no elaborados en confiterias o panaderias ..	177	5,587	6,209,014	21,881,100	30,781,104
Café y especias, tostado y molienda ..	160	1,317	1,944,630	20,319,643	23,831,258
Masas, pasteles, sandwiches y articulos similares, no elaborados en panaderias o fabricas de productos analogos	383	1,978	2,699,168	5,523,675	10,065,488
Legumbres y cereales en forma de harinas y otras preparaciones ..	101	562	660,502	6,100,028	7,564,694
Harina y otros productos de la molienda del trigo	216	6,109	10,534,656	237,245,654	258,002,410
Fideos y otras pastas alimenticias, frescas y secas	541	5,578	5,750,364	27,499,480	37,774,027
Arroz, descascaracion, molienda y otras operaciones	20	373	664,602	17,026,218	18,998,959
Aceites comestibles, elaboración y fraccionamiento	87	3,095	5,242,074	71,026,211	81,617,233
Azucar	41	6,570	13,747,634	63,244,216	107,510,896
Yerba mate, molienda y fraccionamiento	63	2,978	4,327,459	29,592,014	36,507,918
Productos dietéticos	3	81	98,258	167,150	324,916
Galletitas y bizcochos	49	2,996	2,919,021	7,818,256	11,786,450
Miel, elaboración y envasamiento ..	27	57	53,030	230,172	311,640
Licores, otras bebidas alcoholicas y refrescos	85	1,959	3,144,310	27,050,058	32,486,848
Vinagre	20	198	276,915	513,353	1,064,674
Vinos, elaboración (bodegas)	1,777	6,085	9,632,598	40,590,884	54,796,391
Cerveza	19	4,695	7,918,190	11,255,287	37,292,699
Vinos, fraccionamiento	170	2,630	4,197,327	33,821,640	38,126,979
Aguas gaseosas y bebidas sin alcohol	1,361	4,908	6,219,117	5,826,555	15,240,782
Varios	34	1,124	2,093,398	10,187,333	15,347,173

of the National Department of Statistics corresponding to the year 1937, gives a general idea of the various categories within the industry, number of establishments, employees and workmen, raw materials used and goods manufactured.

Facilities granted by Argentine Laws for the importation of machinery and materials used in the food industry.

Owing to the importance of the food industry and the fact that the raw material used is that produced in the country itself, the Argentine laws grant liberal facilities for the introduction into the country of the machinery, equipment, packing materials, etc., used in the industry. National Law No. 12345 grants exemption from customs duties subject to proof of ultimate destination of the " machines shipped to establishments which elaborate raw materials of national production " and also " those materials not produced in the country which are utilised in the process of the elaboration of all raw materials in the said factories ".

Furthermore, special exemptions are granted in respect of those packagings and containers upon which customs duties have already been paid, according to the extent to which said articles are used for packing exported manufactured products.

Included in these exemptions are the following :

(*a*) Wooden boxes used for packing butter and sterilised milk.
(*b*) Flour containers and bags, provided that these weigh more than 250 grams each.
(*c*) Tinplate for containers.

oficiales de la Dirección General de Estadística de la Nación, correspondiente a 1937, da una idea general de las diversas categorias dentro de la industria, numero de establecimientos, empleados y obreros, materias primas empleadas y productos elaborados.

Facilidades otorgadas por las leyes argentinas para la importación de maquinarias y materiales destinados a la industria alimenticia.

Debido a la importancia que la industria alimenticia tiene en el pais y a que la materia prima empleada es nacional, las leyes argentinas otorgan liberalidades para la introducción a la Argentina de las maquinarias, equipos, materiales, envases, etc., destinados a esta industria. La ley nacional No. 12345 establece la liberación de derechos aduaneros, sujeto a la comprobación ulterior del destino, de las " maquinarias destinadas a establecimientos que elaboran materia prima de producción nacional " asi como tambien " los materiales utilizados en el proceso de elaboración de todas aquellas materias primas en dichos establecimientos, que sea necesario por no producirlos la industria nacional ".

Además existen franquicias especiales con respecto a los envases en el sentido de que se devuelven los derechos aduaneros pagados por la introducción de envases, en la medida en que dichos envases se exporten del pais conteniendo ya el producto elaborado. Están comprendidos en esta franquicia :

(*a*) los cajones de madera para envasar manteca y leche esterilizada ;
(*b*) los envases de harina y las bolsas para harina siempre que estas pesen mas de 250 gramos cada una ;
(*c*) la hojalata destinada a envases.

FRUIT AND VEGETABLE CANNING IN CHILE

There are numerous countries having a temperate climate which produce preserved fruit, but the majority of them are unable to grow sufficient to satisfy their own domestic needs. Only a few are in a position to export, the United States being the principal exporting country, followed by Australia, Canada, France, Spain and Italy on a smaller scale.

Chile enjoys certain favourable conditions for the development of this industry on a vast scale, as her climate enables her to grow all fruits found in temperate zones, and whereas until a few years ago she produced only sufficient for internal needs, she has now become a great producer and exporter of tinned fruits and vegetables. This is chiefly owing to her special climate, fertile soil, the short distances between the centres of production and the ports of embarkation, and economic conditions.

An interest in producing standard types of tinned fruits and vegetables has only been awakened in recent years, but commercial experiments and trial shipments have revealed the intense demand which exists in the world markets for standard tinned products, prepared and canned in accordance with international practice.

The Ministry of Agriculture and the Under-Secretariat of Commerce (a Department of the Ministry of Foreign Affairs and Commerce) have diverted the Chilean industry's export trade into this channel through the adoption of a number of measures designed to secure uniform products and so increase shipments. At the same time the Government, realising the importance of the industry, has sponsored legislation for the development of fruit-growing in general, including many provisions intended to assist and improve the canning industry.

Large sums of money have been invested by the Ministry of Agriculture in the installation of an experimental factory for the elaboration of fruit and vegetable preserves, standardised in accordance with the latest practice in the United States. Under Law 4472 special regulations were laid down, to govern the conditions under which preserves may be exported, and unless these requirements are fulfilled the product cannot be shipped. The regulations lay down standards for quality, size of containers, contents, weight, degree of concentration in syrups, packing conditions, etc.

Another measure designed to stimulate the development of this branch of Chile's foreign trade has been that of trial shipments made to potential future markets, and these experiments

LAS CONSERVAS DE FRUTAS Y LEGUMBRES EN CHILE

Numerosos países de clima templado producen conservas de frutas, pero la mayoria de ellos en cantidades que no satisfacen las exigencias de los mercados internos. Sólo unos pocos estan en situación de exportar, siendo el principal Estados Unidos, y además Australia, Canadá, Francia, etc., y España e Italia en menor cantidad. Chile goza de condiciones muy favorables para el desarrollo de esta industria en gran escala, pues su clima le permite producir todas las frutas de clima templado en condiciones inmejorables. Este país, que hasta hace unos diez años se limitaba a abastecer su propio consumo, hoy en dia por sus condiciones de clima, fertilidad de su suelo, cercania de los centros de producción a los centros de embarque y sus condiciones económicas de elaboración, ha llegado convertirse en exportador de conservas. Como es sabido, Chile es, además, desde hace varios años un país exportador de frutas frescas.

En los últimos años se ha despertado un gran interes por la industria de conservas de frutas y legumbres ; los envios comerciales y experimentales han revelado la gran demanda que existe en los mercados mundiales por los productos estandardizados, preparados y envasados de acuerdo con la práctica internacional. El Ministerio de Agricultura y la Subsecretaria de Comercio—esta última, entidad que depende del Ministerio de Relaciones Exteriores y Comercio—han encausado la industria de la conservaría hasta ponerla al nivel de las mejores del mundo. El Gobierno, considerando la importancia de la industria, ha dictado varias medidas de fomento a la fruticultura, y al mejoramiento de la producción de la conservas. El Ministerio de Agricultura invirtió sumas considerables en la instalación de una gran fábrica experimental para la elaboración de frutas y legumbres en conserva, estandardizadas de acuerdo con la práctica de los Estados Unidos.

De acuerdo con la ley 4472, se dictaron reglamentos especiales en que se fijan las condiciones y requisitos con que deben cumplir las frutas y productos vegetales en conservas, sin cuyo cumplimiento el producto no puede ser exportable. La reglamentación establece " standards " de calidad, tamaño de los envases, contenido, peso, grado de concentración del jugo, condiciones de embalaje, etc. La alta calidad de las conservas chilenas ha quedado comprobada por el exito que ellas han tenido en diversas exposiciones internacionales, como por ejemplo en Longbeach, California, en 1928, y en varias otras celebradas en diversos otros países. Los principales países Europeos y Americanos exhibieron colecciones de conservas, y varias firmas chilenas que

have been attended by excellent results, having proved the existence of a favourable demand for Chilean preserves in American and European countries. Private initiative has followed up this experimental marketing on an even greater scale.

As proof of the high quality of Chilean preserves, the success which attended the exhibition of such products at the Long-beach, California, Exhibition in 1928 may be cited. The principal European and American countries exhibited lines of preserves, while Chile was also represented by the products of several firms, all the latter without exception obtaining diplomas of honour and gold medals for the high quality of the preserves exhibited. Similar results were likewise obtained on various other occasions.

Production

Although Chilean preserve production is considerable, it is still insufficient to supply foreign markets with large shipments of uniform types. However, the new plantations now beginning to bear permit the development of sales abroad. There are 21 canning factories of importance now in operation, distributed principally in the central zone of the country. Annual production is calculated at about 15 million tins of varying sizes—that is to say, approximately 10 million kilos. The Provinces of Santiago and Aconcagua are those with the highest production, while the producing capacity of the factories amounts to 25 million tins per year.

The principal fruits used for canning are as follows :

Peaches (white and yellow), the production being approximately one-third of the total fruit preserved; Bartlett pears, and others; various types of plums, grapes, apricots, cherries, quinces, strawberries, papayas, blackberries, etc., all preserved in syrups of varying concentrations, according to kind and quality. Marmalades, jams and fruits in heavy syrup are also preserved, together with fruit juices.

With regard to canned vegetables, the following are the principal ones, in order of importance :

Peas, string beans and tomatoes, preserved in their natural juices or in concentrate or sauces. In addition, canned asparagus, artichokes, maize, pimentos and olives are also produced.

Raw Materials

As mentioned previously, Chile is a great producing country of fruit and vegetables, and the State organisations as well as private enterprises have given their attention to the planting of orchards of those varieties best suited to the canning industry, introducing for the purpose the best species cultivated in the United States and other countries. The sugar used comes from Chile's own refineries, who import it in the raw state, chiefly from Peru. All the tin required has to be imported, and comes principally from Great Britain, the United States and Germany, and in this connection it is interesting to note that in recent years the quantity imported has amounted to nearly 10 million kilos, with an approximate value of 5,000,000 pesos at 6d. As tin is a raw material of the utmost importance in the canning industry, and with a view to developing the export trade in this line, the Chilean Government has authorised special facilities for those industries producing canned goods for foreign markets. One of these facilities consists of the return of all customs duties paid on tin, which is also the case in respect of sugar.

HIGINIO GONZALEZ.

PERUVIAN INDUSTRIES

Peru from Preincaic times has always been a home of industry, and a proof of this may be found in the museums of the great capitals of the world, where specimens of Peruvian aboriginal textiles are exhibited, and some are really wonderful for their fineness and beauty. Subsequently, during the Colonial Period, the frugal native had occasion to demonstrate his atavic skill in the textile industry in the potter's art, etc.

The Wars of Independence and party strifes hindered industrial development in Peru for various decades.

The modern industrial era only dates back some seventy years (the " Arturo Field " Biscuit Factory was established in 1862 and the " Santa Catalina " Wool Works in 1869).

The Government in 1933 adopted a liberal policy in favour of all industries, and began by opening the Permanent Exhibition of National Industry. Later a decree was given ordering the establishment of a Department of Industrial Statistics. In 1934 a canning factory was started in Tacna, which placed on the market all kinds of conserves in the way of fruit, vegetables, etc. In the same year there was formed the Superior Council of Industries

también habian exhibido sus conservas, obtuvieron sin excepción diplomas de honor y medallas de oro, por su alta calidad y buena presentación.

Produccion

A pesar que la producción es considerable, todavía el país no puede proveer grandes cargamentos de tipos uniformes. Sin embargo, los extensos huertos industriales plantados en la última decada estan produciendo cantidades tales que le permiten amplear considerablemente la exportación. Hay en el país 21 fábricas de conservas de frutas y legumbres, distribuidas especialmente en la zona central. La producción anual se calcula en 15 millones de tarros de diversos tamaños, o sea, cerca de 10 millones de kilos. Santiago y Aconcagua son las Provincias que acusan la mayor producción. La capacidad productora de las fábricas es de 25 millones de tarros al año.

Se elaboran especialmente las siguientes frutas :

Duraznos, amarillos y blancos, cuya producción es de aproximadamente la tercera parte de la fabricación total de las conservas; peras Bartlett y otras; varios tipos de ciruelas, uvas, damascos, cerezas, guindas, membrillos, frutillas, papayas, moras, etc., todas en jugos de diversas concentraciones de azúcar, según tipo y calidad. Se elaboran también mermeladas, frutas en almibar y jugos de frutas.

Las principales legumbres en conserva producidas en Chile son, por órden de importancia :

Arvejas, porotos verdes y tomates, al natural, en pasta o salzas. También se producen espárragos, alcachofas, maíz, pimientos, aceitunas, etc.

Materias Primas

Como hemos dicho antes, Chile es un país gran productor de frutas, y los organismos del Estado, asi como también los particulares, se han preocupado de plantar huertos de variedades especialmente aptas para la industria, introduciendo las mejores variedades cultivadas en los Estados Unidos y otros países. El azúcar proviene de las Refinerias Chilenas, que importan el producto en bruto principalmente del Perú. La hojalata es toda importada, principalmente de Gran Bretaña, los Estados Unidos y Alemania. Es interesante anotar que la importación de hojalata en los últimos años ha alcanzado a cerca de 10 millones de kilos, con un valor aproximado de 5,000,000 pesos de 6d. Como la hojalata constituye una materia prima de importancia en la industria de las conservas, y a fin de fomentar la exportación de los productos chilenos, el Gobierno ha otorgado facilidades especiales a los industriales que fabrican conservas destinadas a mercados extranjeros. Una de estas facilidades consiste en la devolución de los derechos de aduana pagados por la hojalata y lo mismo para el azúcar.

HIGINIO GONZALEZ.

LAS INDUSTRIAS EN EL PERU

El Perú desde las épocas prehispánicas ha sido un pueblo industrialista. Ahíestán los maravillosos tejidos aborígenes que causan asombro en los museos de las grandes capitales. Luego, durante el Coloniaje, el sobrio indígena tuvo ocasión de manifestar su destreza atávica en los obrajes o centros regionales dedicados a industrias textiles, de alfarería y alimentación.

Las guerras de la emancipación y las luchas partidaristas, durante varias décadas, paràlizaron el desarrollo industrial del Perú.

La moderna era industrial sólo acusa antigüedad de setenta años (la fábrica de Arturo Field se estableció en 1862 y la de tejidos de lana de Santa Catalina en 1869).

El Gobierno durante el año 1933 inicia una franca acción en favor de la industria; siendo su primer acto la apertura de la Exposición Permanente de la Industria Nacional. Luego se da el decreto para iniciar el servicio de Estadística Industrial. En 1934 se instala una fábrica de conservas en Tacna, influyendo ello a favor de la industria frutícola de todo el pais. En el mismo año se creó el Consejo Superior de Industrias, para cautelar mejor y garantizar la propiedad industrial. En 1935 se estableció el Laboratorio General del Ministerio de Fomento, que está llamado a prestar grandes servicios en la técnica de las industrias. Por último, en 1936 se hizo venir un horno eléctrico metalúrgico, destinado a verificar experiencias en la fabricación de fierro y acero con material de desecho y con minerales de alta ley; significando ello la iniciación de la industria siderúrgica en el Perú.

Lo anterior está indicando que las industrias fabril y manufacturera van a dejar los moldes estrechos de una industria incipiente, y tendrán que orientarse hacia una explotación racional

for the control and protection of industrial property. In 1935, the Ministry of Development installed an up-to-date laboratory for industrial services, and in the following year set up an electrical furnace in order to carry out experiments in iron ore smelting and the fabrication of steel.

From the foregoing it may be seen that there is much activity along industrial lines, and that the country is going ahead, due to the support and protection of the Government acting as a stimulus to the inversion of capital.

Further developments may confidently be expected in the near future, developments that will enormously facilitate industrial expansion, such as the proper financing of hydro-electric plants for supplying power, the creation of regional industrial centres with all the necessary elements, the due development of the paper industry, the manufacture of all kinds of sacks and bags, chemical supplies, etc.

Peru's industrial progress in the last ten years induces one to expect that in the near future the country will be in the lead so far as South America is concerned.

Among the new industrial enterprises which have been started since 1934 are the following: Flour mills, food products, vegetable oils, vinegar, confectionery, beverages and ice, sausages, rice beer, canned goods, margarine, mineral water, yeast ice-cream, chocolate, cartons, glass and boxes.

de todos sus elementos y de todas condiciones tan favorables en el Perú.

Es natural esperar que próximamente se emprenda una bien concertada acción gubernativa para la debida orientación, estímulo y protección de las industrias manufactureras; ya que tal acción vendrá a armonizar el mejoramiento productivo de la Nación, dando útil y segura inversión a cuantiosos capitales desvinculados, que se encuentran prácticamente congelados; facilitando el crecimiento de la República y formando al pequeño industrial, en que se ha de basar el futuro engrandecimiento del Perú.

Cabe esperar que se estudie la mejor manera de establecer sistemáticamente las industrias básicas, con cuyo auxilio la industrialización del país se facilitará grandemente. Las cuestiones de mayor importancia para este fin serían: la financiacíon racional de las fuerzas hidráulicas susceptibles de servir a la industria; la creación de centros industriales regionales, con los elementos debidos; el fomento de materias primas para las industrias del papel, de sacos vacíos, reactivos químicos y otras.

Entre las nuevas empresas industriales iniciadas desde el año 1934 figuran las siguientes: Fábricas de harinas, productos alimenticios, aceites, vinagre, caramelos, bebidas y hielo levaduras, embutidos, cerveza de arroz, conservas en latas, margarinas, aguas gaseosas, helados, chocolate, cartones y cajones.

INDUSTRIAL NOTES

VALVES IN FOOD EQUIPMENT

A vitreous lining to a valve used in connection with liquids and semi-solids in the foodstuff industry is one that makes for hygienic conditions. From this point of view the Saunders Glass-lined Diaphragm Valve, which is fully described in the handbook of the Saunders Valve Co., Ltd., is very intersting. The makers stress the following points: (1) The fluid comes into contact only with the vitreous lining of the valve and the special white rubber of the diaphragm. (2) There are no pockets to trap fluid which may give rise to fermentation or bacterial infection. When the valve is open there is a "streamline" flow right through, and the dismantling of the valve for cleansing is an operation taking only a few seconds. When the valve is closed the rubber diaphragm beds down on the glass-lined seat or weir in such a way that even though the fluid may contain solid particles in suspension there can be no leakage. Again, though the valve action is permanently lubricated, there is not the slightest possibility of the lubricant contaminating the fluid handled. The diaphragm acts as a seal, completely isolating the working parts of the valve from the fluid in the pipe-line.

FOOD PROCESSING EQUIPMENT AND ROAD TANKS

In common with other large-scale plating and engineering houses, Butterfields of Shipley are at present engaged on work which necessitates a limited output for the normal requirements of the food industry. This applies to the processing equipment which Butterfields fabricate in stainless steel, mild steel (plain, tinned or galvanised) and aluminium, and to road transport tanks in the same materials.

The range of food processing equipment manufactured by Butterfields according to specification includes tanks, vats, vessels and troughs, with or without mixing and agitating mechanism. These items are built in mirror-polished stainless steel; there are also pressure vessels in mild steel or aluminium. Allied to these products, but for the purpose of emergency food storage, are made bins in plain mild steel, heavily galvanised, and the salvage campaign has found an important new *rôle* for various Butterfield Bins in the separation and storage of waste food for pigs.

On the transport side, Butterfield Road Tanks and Rail Tanks are doing valuable work in the carrying of liquid foodstuffs in bulk, loads handled being such essentials as milk, glucose, fruit juice, edible oils, etc., which demand to be maintained at a constant temperature to keep the contents in perfect condition and sufficiently fluid for easy handling. To ensure this, the requisite insulation is provided.

NOTICIAS INDUSTRIALES

LAS VALVULAS EN INSTALACIONES DE PRODUCTOS ALIMENTICIOS

No cabe duda que un revestimiento vidrioso en una válvula que se emplee para líquidos o semisólidos, en la industria de productos alimenticios, conduce a condiciones higiénicas. Desde este punto de vista es muy interesante la Válvula de Diafragma Saunders revestida de Vidrio, la cual se describe plenamente en el Manual de la Saunders Valve Co., Ltd. Los fabricantes recalcan los puntos siguientes: (1) El flúido entra en contacto tan sólo con el revestimiento vidrioso de la válvula y el caucho blanco especial del diafragma. (2) No existen cavidades para atrapar flúido que puedo dar origen a la fermentación o infección bactérica. Cuando está abierta la válvula la corriente fluye en toda su longitud sin obstrucciones, y el desmontado de la válvula para su limpieza es una operación que tarda tan sólo unos segundos. Cuando la válvula está cerrada el diafragma de caucho descansa en el asiento o presa revestido de vidrio de manera tal que no pueden ocurrir fugas, aunque el flúido contenga partículas sólidas en suspensión. Además, aunque el mecanismo de la válvula tiene lubrificación permanente, no existe la menor posibilidad de que el lubrificante contamie el flúido. El diafragma acciona como obturador, aislando por completo las piezas móviles de la válvula del flúido que se halle en la tubería.

INSTALACIONES DE PREPARAMIENTO DE ALIMENTOS Y TANQUES CAMIONES

Los productos Butterfield de aplicación inmediata a la Manufactura de Alimentos comprenden Instalaciones de Preparamiento en Acero inoxidable, cuya superficie intensamente dura es especialmente apta para la preparación higiénica de productos alimenticios puros. Los aparatos propiamente dichos, fabricados a especificación particular, incluyen Tanques, Noques, Vasijas, etc., fijos o portátiles, tambien Vasijas de Presión. La casa Butterfield también fabrica en Aluminio y en Acero dúctil (Sencillo, Estañado o Galvanizado).

Por lo que se refiere al transporte de productos alimenticios líquidos en cantidades, los Tanques Camiones de Butterfield trabajan para muchos empresarios en gran escala, dando evidencia satisfactoria de la economía y la seguridad de este método de transportar lor materiales esenciales para la Manufactura de Productos alimenticios. Estos Tanques robustamente construidos y de toda capacidad se emplean para el transporte de Leche, Glucosa, Jugos de Fruta, Aceites comestibles, etc., etc., y se provee un aislamiento apropiado para mantener las cargas á temperaturas constantes, resguardando la condición del contenido y asegurando una descarga fácil.

SOME KESTNER PLANT FOR THE FOOD INDUSTRY

Kestner plants and processes are well known in the food industry, particularly in connection with evaporating and drying. The patent climbing film evaporators have numerous advantages over ordinary boiling pans and basket type evaporators. They have been used for concentrating syrups, gelatine, pectin, etc., for many years. A recent development is the Kestner patent multi-circulation high vacuum and film type evaporator, which enables heat-sensitive liquids to be concentrated to a high density without over-heating or spoiling the flavour. These plants have been supplied for making condensed milk, concentrated whey, gelatine, special milk food preparations, etc. The most recent development in evaporating plants is the new Kestner Horizontal Film Evaporator with all-glass contact on the heating surfaces, which eliminates even the faintest trace of metallic contamination. A number of these plants are working with great success on vitamin preparation and biological extracts.

Powdered food products have enjoyed much popularity of late, and Kestner Patent Spray Driers have been supplied for making invalid food, full cream and skimmed milk powder, whey, ice-cream mixtures, yeast powder, etc. A small-scale Kestner Spray Drier is now available which is particularly suitable for the smaller food manufacturer or for research laboratories where a variety of powdered products have to be made in quite small batches. This unit is self-contained on a mild steel framework and includes a new type of patent dust collector built into the drying chamber itself.

Portable Electric Stirrers made by the Kestner Company are used in many food manufacturing firms for mixing, blending, etc. A new range of stirrer fitted to flame-proof motors of specially light construction are now available.

LACQUERS IN THE CANNING INDUSTRY

The premier lacquers—"Super Zinnatine" for fruits and pickles, "Sulfatine" for vegetables and certain meats, "Zinnatine Marina" for seamless-drawn fish tins—are used enormously for the English can trade, and, being universally known, are exported to almost every country on the globe, and their reputation is world-wide.

At the moment England is packing sixteen hundred million (1,600,000,000) cans per year. This, together with South American, South African, Australian, Portuguese, etc., trade, will give some idea of the amount of Holdens' food lacquers used.

Holden's position in the canning world as suppliers of lacquers is the outcome of over 50 years of continuous research, and their success is due largely to the fact that—in addition to being lacquer manufacturers—they created lacquer users' and canners' conditions in their extensive laboratories, thus enabling them to supply, make up, pack and test under every known condition from freezing to tropical.

In addition to having preserved the contents, the sales appeal of the delightfully clean, golden film is indisputable.

Behind the sales of Arthur Holden and Sons, Ltd., there is a service second to none in the food industry. In stipulating their lacquers reliability is ensured—they are not an experiment; they are a proved success.

SCIENTIFIC INSTRUMENTS

Messrs. Negretti and Zambra have been manufacturers of scientific and industrial instruments for nearly a century, and their apparatus is in use in almost every country in the world.

Originally meteorology absorbed most of their attention, but in the course of time a large range of aeronautical and industrial instruments have been developed.

South America will be mainly interested in their instruments for the control of industrial processes. These comprise Indicators and Recorders, facilitating manual control, and also apparatus for automatic control of Temperature, Humidity, Pressure, Liquid Level, etc.

For temperatures up to 550° C., mercury-in-steel thermometers are used. These carry accuracy guarantees of ½%, in the case of Dial Thermometers, and 1% for Recorders. Exceptional reliability is another important feature. For incandescent temperatures their Pyrometers can be employed up to 1,600° C.

ALGUNAS INSTALACIONES KESTNER PARA LA INDUSTRIA DE PRODUCTOS ALIMENTICIOS

Las Instalaciones y Procedimientos Kestner son bien conocidos en la Industria de Productos Alimenticios, especialmente con respecto a la evaporación y la disecación. Las evaporadoras patentadas de película ascendente tiene numerosas ventajas sobre las hervidoras y evaporadoras de tipo cesta corrientes. Hace muchos años que se emplean para la concentración de jarabes, gelatina, pectina, etc. Un desarrollo reciente lo constituye la evaporadora patentada Kestner de tipo de multicirculación de alto vacío y película que permite la concentración a una alta densidad de los líquidos sensibles al calor, sin sobre-calentamiento y sin echar a perder el sabor. Se han suministrado dichas instalaciones para la elaboración de leche condensada, suero concentrado, gelatina, preparaciones especiales de alimentos de leche, etc. El desarrollo más reciente en instalaciones evaporadoras es la Evaporadora de Película Horizontal Kestner con contacto enteramente de cristal en las superficies de calentamiento, la cual elimina hasta la menor traza de contaminación metálica. Un número de estas instalaciones está operando con mucho éxito en la preparación de vitaminas y extractos biológicos.

En tiempos recientes los productos alimenticios en polvo han gozado de mucha popularidad y se han suministrado Disecadoras patentadas Kestner de pulverización para elaborar alimentos para enfermos, polvos de crema entera y de leche desnatada, suero, mixturas para helados, levadura en polvo, etc. En la actualidad se produce una Disecadora Kestner de pulverización de tamaño pequeño que es muy conveniente para el fabricante de productos alimenticios en pequeña escala, o bien para laboratorios de investigación científica donde tengan que elaborarse diversos productos en polvo en cantidades pequeñísimas. Este es un grupo completo en sí sobre un bastidor de acero dúctil e incluye un nuevo tipo de recolector de polvo patentado construido dentro de la misma cámara disecadora.

Las Batidoras eléctricas portátiles que hace la casa Kestner las emplean muchos fabricantes de productos alimenticios para mezclar, combinar, etc. Ahora también se produce una nueva serie de Batidoras conectadas a motores resistente a la llama y de construcción notablemente ligera.

LAS LACAS EN LA INDUSTRIA DE CONSERVAS

Las lacas sobresalientes—Super Zinnatine para frutas y encurtidos, Sulfatine para legumbres y ciertas carnes, Zinnatine Marina para latas estiradas sin costura para pescado—se emplean muy extensamente en la industria de conservas alimenticias de Inglaterra y como son conocidas en todo el mundo se exportan a casi todos los países del Globo, siendo universal su reputación.

En la actualidad Inglaterra está envasanda un mil seiscientos millones de latas al año. Esto, unido a las exportaciones a la América del Sur, Sud Africa, Australia, Portugal y sus dominios, os dará alguna idea de la cantidad de lacas Holden para conservas alimenticias que se emplean.

En el mundo de los fabricantes de conservas alimenticias Holden ostenta una posición que se debe a más de 50 años de investigación científica. El éxito de esta casa puede atribuirse en gran parte al hecho de que—además de ser fabricantes de lacas—han creado en sus extensos laboratorios análogas a las que experimentan los Fabricantes de Conservas Alimenticias y otros que emplean lacas. Esto les permite suministrar, envasar y ensayar bajo todas las condiciones que se puedan experimentar, desde el frío intenso hasta el calor tropical.

Además de conservar el contenido, no se puede disputar que a película dorada tan exquisitamente limpia fomenta las ventas.

Respaldando las ventas de Arthur Holden and Sons, Ltd., existe un servicio sin rival. Al estipular las lacas de esta casa se asegura Vd. la confiabilidad. No son un experimento; son un éxito establecido.

APARATOS PARA LAS CIENCIAS

La casa Negretti y Zambra se dedica a la fabricación de aparatos para las ciencias y para las indústrias desde casi un siglo y sus productos se encuentren en uso, por así decir, en todos los paises del Mundo.

En los primeros años se ocupó principalmente de aparatos relacionados a la meteorologia pero con el transcurso del tiempo

Humidity control is effected by three main types—wet and dry bulb thermometers, hygroscopic elements and electrical conductivity apparatus. These three enable humidity to be measured over a wide range of temperatures and under many different conditions.

The physical factors referred to above can be controlled by pneumatic or electric means, and extremely close results obtained on correctly engineered schemes.

Messrs. Negretti and Zambra will be pleased to send literature and illustrations to any firm interested who cares to apply.

LABELS AND EMBOSSED SEALS

Walsall Lithographic Co., Ltd., are one of the biggest producers of labels in this country, and as they have every type of process under one roof they are able to produce huge runs at maximum speed and minimum cost.

They have their own photographic studio, make their own litho plates and have their own staff of artists.

For many years they have specialised in the production of embossed seals and for which they have a huge demand all over the world. Particular attention is drawn to their Metcraft process, from which very wonderful results can be obtained in various metallic finishes.. The process consists of embossing very thin metal on gummed paper, and these adhesive seals can be used for a variety of publicity purposes.

Metcraft has also been extensively used for plaques and other types of advertising display. It is equal in appearance to a cast metal plate, but Metcraft is of course much less costly and considerably lighter in weight, and such plaques have in many instances replaced solid metal plates.

Walsall Lithographic Co., Ltd., are particularly well equipped for producing work for overseas markets; they have had wide experience not only of the countries but also of the various languages.

SPEEDING UP SHIPMENT OF EXPORTS

Steps are being taken by the Board of Trade to speed up shipment of goods for export.

"We wish to quicken the turn-round of shipping at ports, avoid waste of accommodation in dock sheds, lessen the strain of road and rail transport, and ensure a smoother flow of goods through the ports," an official of the Board of Trade said.

Exporters who experience difficulties in obtaining rail transport are urged to get into touch promptly with District Goods Officers of the railway companies. Many difficulties, it is said, can be overcome in this way. Others can be dealt with by the Board of Trade representatives on the Area Boards, under whom in some areas Board of Trade transport officers are already working. Exporters should also be guided by their own agents as to the right time for sending their goods forward.

"Much delay has been caused, and in some instances goods have had to be sent all the way back from docks to the manufacturers," the Board of Trade official said, "by failure of a number of exporters to acquaint themselves and comply with export control requirements which are essential in war-time.

"Before goods leave the country it is necessary that full details about them be supplied to the Customs authorities, so that the goods can be 'pre-entered' and checked.

"Particulars of pre-entry requirements may be obtained from the Customs. Full information about exchange control can also be given by the Customs or by any bank. Shipment of goods for export will be considerably speeded up if every exporter will see that as far as possible entry forms have passed through the Customs before goods are sent to the docks.

"Customs authorities have simplified and speeded up the procedure on their part as far as possible. For certain Empire destinations they have also suspended for a trial period the requirement of pre-entry for goods not on the prohibited list. It is not possible to go further in this direction without sacrificing the essentials of export control.

"It is up to exporters now to do their part. After they have acquainted themselves with what is required, they should complete the necessary forms or give their shipping agents the necessary information to complete them as much in advance of the prospective date of shipment as possible. Where a currency declaration (form C.D.3) is required for exchange control purposes, this should be completed by the exporter and submitted to the Customs with the pre-entry."

se desarrolló una gran serie de aparatos para la aviación y para las indústrias productoras.

Probablemente lo que más atraerá la atención de los Señores Sud Americanos es lo que construye para la regulación de procesos industriales. Los aparatos comprenden indicadores y registradores que sirven de guía para la regulación manual y aparatos para la regulación automática de Temperatura, Humedad, Presión en más ó en ménos, Niveles de Líquidos, etc.

Para temperaturas de hasta 550° C. se emplean termómetros de mercurio-en-accro que se garantizan tener una precisión del $\frac{1}{2}$% para termómetros de cuadrante y del 1% para registradores. También se distinguen por su robustez excepcional. Construyen también pirómetros para temperaturas incandecentes de hasta 1,600° C.

La regulación de la humedad se consigue por el uso de tres tipos principales: termómetros de ampollas secas y humedas, elementos higroscópicos y aparatos basados en la conductividad eléctrica. El empleo del sistema apropiado permite medir la humedad por bastante extensa gama de temperaturas y en gran variedad de condiciones.

Los cambios físicos a los cuales se alude arriba se pueden regular empleando un sistema de mando sea neumático sea eléctrico y cuando las disposiciones tomadas son aptas se consiguen rsultados de precisión muy notable.

Con sumo gusto mandará la casa Negretti y Zambra pormenores detallados y grabados a los intereados que los pidan.

ETIQUETAS Y SELLOS EN RELIEVE

La casa Walsall Lithographic Co., Ltd., es una de las casas productoras de etiquetas mayores de este País, y ya que tienen bajo un mismo techo todo tipo de procedimiento, están en condiciones de producir tiradas enormes con el maximo de rapidez y el mínimo de costo.

Tiene su propio Taller Fotográfico, hace sus propias planchas litográficas y tiene su propio personal de artistas.

Hace muchos años que especializa esta casa en la producción de sellos en relieve, para los cuales reciben una gran demanda de todas partes del mundo. De manera especial llamanos la atención a su procedimiento Metcraft, del cual se queden lograr resultados maravillosos en diversos acabados metálicos. El procedimiento consiste en estampar en relieve sobre un metal muy delgado que se aplica sobre papel engomado, empleándose estos sellos adhesivos a una infinidad de fines de propaganda.

Metcraft se emplea extensamente también para placas o medallas y otros tipos de material de publicidad. En apariencia es igual a una placa de metal colado, pero como es de suponer Metcraft resulta mucho menos costoso y es de peso mucho más ligero. Se dan muchos casos en que las placas Metcraft han substituido planchas de metal macizo.

Las Señores Walsall Lithographic están excepcionalmente bien preparados para producir trabajos para los mercados de ultramar, ya que tienen una extensa experiencia no tan sólo de los diversos países sino también de sus respectivos idiomas.

TIN CONSERVATION TESTS

A project to determine the feasibility of reducing the amount of tin on tinplate used for food containers is being conducted by the National Canners' Association, in collaboration with American Can Co. and Continental Can Co., as part of the general programme of tin conservation in the United States. The research was proposed by Lieut.-Colonel Paul P. Logan of the U.S. Army Quartermaster Corps.

For the purpose of the tests, tinplate was prepared, having two different weights of tin coating. Cans were fabricated in the sizes commercially used for the products to be packed, using standard automatic processes which were followed as closely as the sheet size and weights permitted. Cans were packed with various food products, selected to represent major classes with reference to their action on tinplate. Army rations were among the products canned.

On arriving at Washington, the cans were placed under incubation at 85° F., since it was considered that this storage temperature would reasonably accelerate any abnormalities brought about by the lighter tin coating, without producing such false effects as might result at a substantially higher temperature. A few cans from each lot are being held at room temperature. The cans are being subjected to numerous storage tests, but results of the project will not be available for some time.

(Through "The National Provisioner.")

STARCH AND FOODSTUFFS

Part I.

J. A. RADLEY, M.Sc., A.I.C.
Author of *Starch and its Derivatives*

THE most abundant material in the vegetable world after cellulose is starch, which is present in all green plants in the form of microscopic granules. Apart from the extremities of the rootlets and the tips of the buds, it appears to be distributed throughout the plant in varying amounts. It functions as a reserve food material of the plant and forms a major constituent of many foodstuffs prized by man. Wheat, maize, barley, rye, rice and potatoes contribute very largely to man's diet throughout the world, and of the solid matter present in these materials starch forms a large part.

Antiquity of Starch Manufacture

Starch itself has been known since at least 184 B.C., when it was described by Cato, the starch mentioned being that from wheat, from which it was prepared by kneading softened wheat grains in water, sieving and drying the deposited starch in the sun. Of the large amount of work done on starch since that time much is of practical interest to the food manufacturer. Starch is a white, insoluble powder varying in microscopical appearance with its source, the particles showing a wide range of particle size. When heated with water these granules swell to many times their original size, and with some types the sac formed bursts and liberates a clear fluid from the interior. At 5 per cent. concentration in water starch forms a strong gel when strongly heated and cooled; of this behaviour full use is made in the manufacture of several foodstuffs, whilst the partial gelatinisation in the presence of limited amounts of water has a distinct bearing on certain processes.

Maize, wheat, rice, potato, arrowroot and sago starches are those most commonly encountered in the foodstuffs industry, not only as raw products, but as integral parts of the many substances handled. They also form a starting-point for the manufacture of other raw products of interest to the food manufacturer—for example, glucose, vinegar, etc. The chemistry of starch also is closely bound up with the brewing and fermentation industries, and, although some maintain that beer is a staple food, we do not intend to deal with the fermentation industries in this article.

Outline of Starch Manufacture

Wheat starch can be prepared by several methods. In wheat, the starch present has to be separated from the protein matter, or gluten, of the grain. Wheat gluten when wet can be kneaded into a coherent mass, and this forms the basis of the modern methods of separating it from the starch. Softened grain or wheat flour is kneaded to a dough with water and allowed to stand for some time, after which further kneading in a stream of water takes place until eventually a mass of impure, plastic, wet gluten remains. This contains a fairly high proportion of starch, and when freed completely from the latter it forms a valuable adjunct to diabetic foods, while the impure varieties can be used in adhesives, in the baking trade and as a starting-point for making sodium glutamate, which is of value in the manufacture of soups, gravies, etc. Wheat starch can also be separated from the gluten by allowing the latter to ferment and decompose, after which the starch is separated from the gluten by allowing sedimentation to take place, followed by washing the deposited starch. At the present time, however, the by-product gluten is more valuable than the starch, so that the latter looks like appearing in the rôle of a by-product of manufacture of the former.

The Different Starches

Maize starch is prepared from Indian corn, or *Zea mays*. The corn is softened in water containing sulphur dioxide and then lightly crushed to separate the embryos, which are removed and yield valuable by-products in the form of maize oil and cattle feed. The corn is then ground with water in a Buhr-stone mill, the liquid being delivered into an inclined shaking sieve. The starch is next concentrated by "tabling", and after a thorough washing is finally dried.

It will be noted that the gluten from the maize differs entirely from that of wheat in that the latter forms a tough, coherent mass, whereas the former does not. This difference in properties makes it necessary to use entirely different techniques to separate the starch in the two cases.

When rice starch is prepared the rice grains, generally broken granules rejected from rice-dressing operations on brown rice, are soaked until soft in dilute alkali, then milled in a disintegrator and the liquid centrifuged in an imperforate-drum type of centrifuge. Heavy impurities are found on the outside of the centrifuge cake and gluten and light impurities in the middle. These are scraped away and the starch paddled with water and again centrifuged or settled, and when so treated several times the last-made starch liquor is adjusted to a certain specific gravity and led into draining boxes, after which the moist cakes are dried.

Potato, tapioca and other tuber starches can conveniently be considered together, as the technique of separation is very similar in each case. The tubers are washed thoroughly to remove all dirt, small stones, etc., and then grated in a specially designed machine. The pulp from these machines is washed with water and the "starch milk" passed through fine sieves to remove cellulosic fibre, after which the starch is settled in concrete vats or else "tabled"—*i.e.*, the liquid is passed down long, shallow, slightly inclined channels in which the starch is deposited, while the soluble salts and fibrous impurities pass on in the water. The starch is flushed and retabled several times with fresh water and then dried. It is not necessary to go into the refinements of the various processes here, nor would a description of the methods used to obtain an economic running of the plant be of any direct interest, so we may pass now to a brief survey of the physical properties and chemistry of starch to see in what manner this affects its use in the food industry.

Gelatinisation of Starch

As stated above, starch is insoluble in cold water, but when a suspension in cold water is poured into boiling water or is itself boiled the granules swell and, on cooling, form a jelly when the concentration of starch present is high enough. Rice and maize starch both form "short", opaque white gels if heated above 75° C., whilst translucent, rather adhesive gels are formed from potato or tapioca starches if these are heated to about 70° C. with five to ten times their weight of water.

We have also previously mentioned that each starch consists of granules of varying sizes, and it has been found that the larger granules swell at a lower temperature than the smaller ones. This has a direct bearing on the making of starch pastes, since, on heating starch with water to the gelatinising temperature of the larger granules, these swell, gelatinise, and in doing so absorb water, so that there is less free water available for the smaller granules. The latter are protected by the dilute gel, thus formed, from coming into contact with what free water is left. The apparent gelatinisation temperature is therefore higher than if the small granules were gelatinised in the absence of large granules. The small granules already possess a higher gelatinisation temperature than the large granules, so that, although it might be expected that all the granules should gelatinise within a temperature range of some 10° to 15° C., it is often necessary to boil a starch suspension before all the granules are fully swollen (*vide infra*).

Study of Gels

Professor Sybil Woodruff has examined and photographed gels made at different temperatures from starches used in the food industry, and her photographs constitute excellent permanent records of the differences in physical appearance that otherwise could not be described adequately. The outline of a gel turned out from a mould gave good indications of its character, although differences were noted in opacity, tenderness and freedom from stickiness. The addition of sucrose, such as is made in some sweetened starch puddings, was found to lower the gel strength.

Chapman and Buchanan (1930) have studied the syneresis, or slow separation, of water from gels of maize, wheat, rice and potato starches and consider that neither the rate nor the time of heating the suspension affects the rigidity or the amount of syneresis in the resulting gels. The importance of this will not be overlooked by those interested in blanc-mange and custard-powder manufacture.

Heating of Suspensions

When heating starch suspensions the opacity slowly decreases, and at the temperature of gelatinisation it falls quickly to a minimum value which is not affected by heating for a longer time or at a higher temperature. Heating to this point, however, is insufficient to produce good gels, since, as explained above, all the granules are not fully swollen. If the heating is continued to about 100° C., well-formed gels are formed from 5 per cent. suspensions of maize, rice and wheat starches, but potato, arrowroot and tapioca starches give soft or quite fluid gels. The rice gel is the most translucent and tender, the maize the firmest and whitest, while wheat starches give a gel of intermediate characteristics. Potato starch gels are ropy, transparent and stick to the mould; arrowroot gives a still more transparent and softer gel; whilst tapioca starch does not give a gel at the concentration used.

The results show that to obtain the maximum strength of the gel it must be heated well beyond the temperature at which the opacity suddenly decreases. In ordinary cooking, of course, temperatures of 90° to 100° C. are readily reached. With potatoes properly cooked internal temperatures of 100° to 104° C. have been recorded, but if the internal temperature reaches only 97° C. the potato is underdone. In biscuits and muffins a temperature of 100° C. is reached, but in these cases, however, it must be remembered that the granules cannot be completely swollen, as the amount of water is very limited. If starch containing about 45 per cent. moisture is heated to 90° to 100° C., the granules swell but do not gelatinise and remain as discrete particles.

When starch is examined microscopically between crossed Nicols prisms the granules appear strongly bi-refringent and the bi-refringency disappears when the granules gelatinise. Alsberg has examined breadcrumbs microscopically and found that, although bi-refringent masses could be seen, no individual bi-refringent granules could be detected. This is explained by Woodruff's observation (*J. Agric. Res.*, 1933, 46) that the temperature at which bi-refringency disappears—*i.e.*, at which the granules are swollen—depends on the amount of water available.

In making custard or blanc-mange powders another point of interest is that different strengths may be obtained by the use of different batches of the same starch, as Woodruff has found that the ability of a starch to form a gel can vary according to the source of the starch. She found (*Trans. Illinois State Acad. Sci.*, 1936) that gels of maize starch made from corn which had suffered from heavy frosts before it was completely mature did not leave the mould as cleanly as usual, but that the ability to form a gel did not appear to be noticeably affected.

Another important factor is the effect of the purification processes during manufacture of the starch. It is customary to steep maize in water saturated with sulphur dioxide (*vide supra*) to reduce bacterial and fungoidal growth, to increase the speed of softening and to give the final product a good colour. Starch separated without the use of sulphur dioxide, however, gives stronger gels than that made using the normal sulphur dioxide treatment.

With wheat starch an improvement in colour, together with an improvement in baking properties, is obtained by bleaching which can be carried out in about five different ways. The bleaching process is very akin to the sulphur dioxide treatment of maize, but Woodruff (*vide supra*) found that such treatment has little or no effect on the gel-forming properties of the wheat flour. This is probably due to the fact that the gelling power and the viscosity of maize starch pastes are more readily affected by the addition of chemicals or the pre-treatment of the starch than is the case with wheat starch.

Freezing of Starch Pastes

The effect of freezing on starch pastes is interesting and may hold some interest for food processers, not only from the foodstuff point of view, but also because they may be using starch pastes for adhesives in some part of the factory. By freezing and then thawing a starch paste the jelly-like structure is destroyed and a spongy mass results. With maize starch the water can be squeezed out readily by hand, after which it will readily soak up water again, without, however, giving the original gel. From wheat starch the sponge formed retains the water more firmly than that from maize starch and is not so tough (Woodruff, *J. Agric. Res.*, 1936, **52**, 233). When allowed to dry, it gives a very tough, horny mass, differing very markedly from that obtained by drying maize starch "sponge."

It is interesting to note that the appearance and properties of the gels changed to a much greater degree when the pastes were frozen at −2° to −3° C. than at any other temperature (see *Starch and its Derivatives*, J. A. Radley, London, 1940). At the temperatures given by solid carbon dioxide or liquid air the rapid formation of small ice crystals and the lack of facilities for orientation of the starch molecules probably explain the lesser change which takes place on freezing to these low temperatures. After freezing to such low temperatures the pastes, on thawing, have a consistency very similar to a freshly gelatinised paste, and microscopical examination shows that it has a very "short" or "brittle" appearance, whereas paste frozen at −2° to −3° C. shows a ropy network. Woodruff has shown that there is a fairly sharp transition temperature at −25° C., in that pastes frozen below the temperature gave the smooth form on thawing, but if this temperature is not reached, then thawing produces the "ropy" form.

With starch from different varieties of maize it has been found that the gel strength of the pastes varies over a wide range, the starch from white corns giving stronger gels than those from the yellow types. The viscosity differences between these pastes are not very pronounced, but if a pectin-jelly-strength tester be employed to measure the gel strength of these pastes wide variations are encountered. Thus a test based on the gel strength would appear to be much more valuable to the food manufacturer than one based on the more usual viscosity test, which does not show the effect of poor growing conditions or of frost on the growing corn which is reflected in the gel strength of the starch made from such corn. Another point of interest is that rapidly raising the temperature to 95° C. gives a firmer gel than slowly heating to that temperature.

Starch as a "Filler"

For many types of work starch constitutes an excellent raw material. It can be used where an inert, neutral filler is required or where it is desired to thicken up a hot liquid such as a soup, etc. As we have seen, by suitable choice of starch strong gels containing 90 to 95 per cent. of water can be obtained, and such gels are readily coloured so as to have an attractive appearance. Owing to its colloidal nature, it exerts an appreciable protective effect on certain types of emulsions and has, therefore, been used for certain kinds of mayonnaise.

Starch has been used as a comparatively inert filler in a number of preparations. One such product is that known as baking powder, which is added to the materials used to make bread, cakes, etc., in order to leaven the product—*i.e.*, to give off a certain amount of gas during the baking process and thus distend the mass to a honeycomb structure. Much work has been done on the suitability of various starches as inert fillers. W. Gallay and A. C. Bell have studied very thoroughly the effect of additions of potato, maize, wheat and rice starch and found that the stability of the mixtures depends on the granule size of the starch, so that rice starch gave the most and potato starch the least stable powder. Even with the same starch, one which has been finely ground gives better results than a sample which has been only coarsely ground. S. Mendelsohn (see this Journal, 1938, October, p. 333) has presented an excellent account of the function of starch in baking-powder media. He points out that rice starch is more costly than other commercially available starches and often contains residual adsorbed alkali which would affect the taste, but this would not be a drawback in baking powders. Wheat starch "fines" have granules of approximately the same size as those of rice starch, and are as efficient as the latter for stabilising purposes. Corn starch, however, keeps the constituents of the baking powder separated more efficiently than other sources, and this efficiency is so marked that it outweighs the effect of the greater surface which is presented by this starch and which makes for greater moisture absorption than is the case with rice starch. It is interesting to note that maize starch granules have an average size which is very close to the mean granule size of the other starches mentioned above.

Good dry corn starch has for many years been employed in this type of work and looks likely to maintain this position in the face of competition from other agents suggested as fillers in patent literature, especially as the suggested substitutes are, in most cases, more expensive in use.

In the above case it will be seen that a balance has to be struck between the surface area per unit mass, which affects the absorption of moisture and hence the stability of the reactive mixture, and the granule size, which governs the effective separation of the components of this reactive mixture. Rice starch and wheat "fines" present low surface areas, wheat starch a much higher area, whilst maize starch has an intermediate value, but the particle size of the latter affords a more efficient protective effect on the particles of the constituents of the mixture.

(*To be continued*)

Book Reviews

FUNGI AND HUMAN AFFAIRS

Fungi have been historic determinants of human affairs. The Potato Blight fungus, by destroying the stable food supply of a human society, brought more of death and suffering than any other disaster since the Napoleonic Wars. In 1846 it was the straw that turned British high political policy away from self-sufficiency. In alluding to the repeal of the Corn Laws, the Duke of Wellington's comment was, "Rotten potatoes have done it all!"

WHEN a chemist suddenly achieved considerable success as a novelist it seemed quite a new thing; many of the chemical journals went "all literary" and published laudatory reviews of Mr. E. C. Large's *Sugar in the Air* and of his second novel *Asleep in the Afternoon*.

We now have a scientific work* from his pen, and I must confess that it was with considerable curiosity that I opened the important-looking volume. Would it be the somewhat familiar product of a scientific man "writing down" to the layman, ofttimes as unsatisfactory (albeit in a different way) as a layman touching upon scientific subjects. I have just read an example of the latter in H. A. Vachell's recent volume of essays, in which this appears: "Collectors of old furniture distrust the eye. They rely on the sense of touch. A bit of rock crystal is different to detect from its counterfeit presentment of glass. Put it on your tongue. *Glass is the temperature of the room it stands in; crystal is nearly as cold as ice.*" (Italics mine.) However, that is all by the way.

Mr. Large's book is not a textbook, but he certainly does not "write down", although the non-scientific reader should find no difficulty in following his various theses. He writes on his own subject—"he is a specialist in insecticides and fungicides and has done much liaison work with farmers and agricultural research in many countries," as we are told.

For the general reader it is probable that there are many subjects more attractive than fungi, but it is certain that, if he starts reading the first few lines of the first chapter, he will have difficulty in putting the book down. Mr. Large knows the novelist's "tricks of the trade" by this time, and uses them to good advantage, without adversely affecting the scientific exposition of the matter. His handling of "suspense" is masterly.

Mr. Large uses the historical approach and deftly mixes quotations from original scientific papers with newspaper accounts of the times he writes about. Neatly and in picturesque manner does he draw upon fungal terminology itself in commenting on a report made in *The Times* on the condition of the people in Ireland in the year 1845:

> "Foster's account of the people amongst whom the Potato Murrain descended, as plague and fire had once descended upon crowded London, was a story of parasitism, of a horrible rent-collecting system, whose hyphæ and haustoria, or tentacles and suckers, reached down into every wretched cabin, and drained the substance of the people and the land."

The repercussion upon English politics of the Irish potato famine is thus described:

> "Peel, insolent and aloof in manner, an aristocrat of the rising industrial breed, whose wealth came from the Lancashire cotton mills, was not greatly concerned to alleviate human suffering. He exploited the situation with magnificent political opportunism. . . . On January 27th, 1846, Peel made his great speech in the House of Commons for the repeal of the Corn Laws. His heart bled for the suffering Irish; in England there was no grain to send them, for in England also the shortage of food was causing the greatest distress. . . . The Tories were aghast. For months the tremendous angered debates went on. Neither friends nor enemies were taken in, for Peel's humanitarianism reeked of guile. The Irish had been left to starve before, their present misery was being exaggerated, could not such epoch-making and dangerous measures be deferred until the real extent of the distress was seen? In histrionics Peel surpassed even himself. 'Good God!' he cried. 'Are you to sit in cabinet and consider and calculate how much diarrhœa and bloody flux and dysentery a people can bear before it becomes necessary for you to provide them with food?'"

Mr. Large follows in the same manner the course of investigations on the cause of the potato blight. The Duke of Northumberland, through the Royal Agricultural Society of England, of which he was Vice-President, offered a prize of fifty sovereigns for the best essay on a remedy for the potato disease, but when it came to a remedy the essayists' principal achievement was to call the disease by a new and rather grand name—*Gangrœna vegetabilis*, or simply "vegetable gangrene". The prize-winning effort on the cause of the disease amounted to a statement that it was due to the unhealthiness of the plants. It was finally agreed that the fungus be called *Botrytis infestans* Mont., after Dr. Montagne, who had described the fungus adequately at a session of the Société Philomathique in Paris on August 30th, 1845, and was considered to have the priority over other workers by a few days.

"For once, in the history of plant pathology, the announcement of the outbreak of a new disease was coincident with the publication of an effective remedy for it." In these words the author refers to a new malady which had attacked the grape vines near Margate in 1847. The disease ended in the total decay of the fruit. Mr. Tucker, gardener to J. Slater, Esq., of Margate, obtained access to a powerful microscope and, examining the foliage, saw that a powdery mildew was growing on it, and, without waiting for the fungus to be identified, and untroubled by any philosophic doubts as to whether it was the cause or the consequence of the disease (as indeed had been the case with the early investigators of the potato disease), he looked about him for a practical way of stopping it. Mr. Tucker was accustomed to using sulphur as a specific agent against mildew on peach-trees, and he now tried sulphur for this new trouble on the grape vines. He made up a mixture of flowers of sulphur and lime in cold water and applied it to the leaves with a sponge. He published a humble account of his observations in a letter to the *Gardeners' Journal*, and the Rev. M. J. Berkeley, in the more influential *Gardeners' Chronicle*, pronounced that the causal fungus was a species of "Oidium" not previously reported. Mr. Tucker's name was translated into Latin and the fungus called *Oidium Tuckeri*, and was destined not only for immortalisation in the dusty records of cryptogamic botany, but for immediate, widespread and mournful celebrity. For the disease broke out in France. Mr. Large follows the course of the investigations made, the difference of opinion between the investigators of the time, and the remedies tried to combat the disease.

The foregoing has only brought the present reviewer to the fourth chapter of the book, and leaves sadly little space for the rest. The Bunt of the wheat is discussed in much the same manner, and the series of articles on vegetable pathology written by the Rev. M. J. Berkeley in the *Gardeners' Chronicle* are mentioned. Berkeley's work and writings are well described. The author cannot resist the temptation to interpolate his comments with perky asides such as:

> "Berkeley . . . was a taxonomist, instinctively given to sorting things into genera and species, to which he could assign Latin, or preferably Greek, names. He probably divided all the venal and mortal sins into genera and species on Sunday mornings, and he managed to divide the 'diseases' of plants, on weekdays, into forty-two genera."

We read again with unabated interest the immortal and oft-told story of the work of Pasteur, Anton de Bary, Huxley and the rest. One of the by-products of de Bary's researches was the solution of the ancient riddle of the Barberry and the Rust of the Wheat. This riddle was set in antiquity, guessed in 1809, and solved in 1865.

We are taken in similar fashion through clubroot, canker of the larch, coffee rust in Ceylon. Interpolated between the latter and a short chapter on Bordeaux Mixture is a chapter describing the work done in combating the advance of the fungi during the decade between 1880 and 1890, which is described as the period of the Seventh Plague.

* The Advance of the Fungi. *E. C. Large. Pp.* 488. *With* 58 *Figs.* 18*s. net.*

"Passing over the ancient Rust and Smut and Ergot of the cereals, and beginning with the Potato Blight in 1845, there had been full seven plagues, more widespread and more destructive than any Pharaoh knew. They came in the wake of the industrial revolution, with the specialised cultivations and with the growth of maritime trade. Some were ancient, some were new; they were no mere visitations; where they were introduced they came to stay. The Muscardine and the Pébrine of the Silkworms, the Potato Blight, the Oidium of the Hops and the Vines, the Phylloxera, the Locusts, the Canker of the Larch, the Rinderpest of the Cattle and the Anthrax of the Sheep, the Salmon Disease, the Hemileia on the Coffee—and now the Colorado Beetle and the Peronospora or Downy Mildew of the Vine. Yes, assuredly, by 1885 there had been forty years of plague."

I have no space left to do justice to the chapters on curative treatments, legislative measures taken, virus diseases and a host of other matters, but what has been said will serve to indicate the attractive nature of the author's treatment of his subject. The bibliography is well set out for easy reference, the index is adequate, and the fifty-eight figures are outstandingly clear.

T. Crosbie-Walsh.

LESSONS IN REFRIGERATION AND AIR CONDITIONING

Running serially in *The National Provisioner* is a series of articles comprising a course of lessons on Meat Plant Refrigeration and Air Conditioning, and the first thirty-seven of these articles have now been published as Volume I.

The publishers state that, although there are some splendid books on refrigeration, there are none which treat specifically the practical daily refrigerating problems confronting the meat plant worker. The first article of the course appeared in July 30, 1938, and it has been a regular feature ever since. The course has been prepared by a meat plant engineer, an expert in packing-house refrigerating problems, and was designed to enable those interested to acquire a practical working knowledge of the subject as well as fundamental information essential to the worker who has ambitions beyond his present job.

The excellent arrangement and the lucidity of exposition of a highly technical subject is one of the features of the articles, which are copiously illustrated by graphs and photographs and include useful tables. The volume should be in the hands of any worker in refrigeration plants who wishes to obtain an insight into the subject.

Meat Plant Refrigeration and Air Conditioning, vol. i. 35 *Lessons. P.* 31. *The National Provisioner.*

IMPROVED WHITE BREAD

From a Correspondent in Auckland, N.Z.

Considerable interest has been aroused by the announcement of a new baking process evolved by New Zealand's Wheat Research Institute. The idea is to enable the nutritive qualities of the wheat germ to be included in bread made from white flour. The Institute claims that white bread can thus be given the advantages of that made from wholemeal.

The new bread is not intended to replace the wholemeal article, the beneficial qualities of which, apart from the vitamin content, are fully recognised. That the health-giving vitamin B_1 exists in the wheat germ in rather high proportion has long been known. But it is stated that the problem of introducing it into white bread in such a way that the palatability and keeping qualities of the bread are not affected had not been solved until the discovery of this new process.

In announcing this development, the Minister of Health points out that, although there is nothing particularly new in adding the vitamin B_1 to white bread, the New Zealand method has some advantages over the practice in the United States and England, especially when soft flour is used.

Special Advantages

The feature which distinguishes the New Zealand process from others is the pre-fermentation of the wheat germ with the yeast before addition to the flour, by which the injurious effect of the germ on the texture and volume of the loaf is avoided.

Exhaustive trials over a period of twelve months have resulted in a loaf of good appearance, fine texture, a taste practically indistinguishable from that of ordinary white bread, and a content of 10 per cent. of wheat germ. This percentage compares with 2 per cent. for whole-wheat bread.

The special advantages of the process, from the point of view of the flour miller and the baker, are that it requires no special treatment of the germ at the flour-mill, and is designed to interfere to a minimum extent with normal baking procedure. It is known that one or two processes which have aimed at including wheat germ in white bread have been in use in New Zealand, but have been protected by patents.

A Future for the New Process

The Wheat Institute is now satisfied, apparently, that the new process will be available to all bakers and consumers, and is, moreover, an entirely new process. No additional cost to the baker is involved in the purchase of the germ, and the new loaf retailed at the same price as the ordinary kind.

It may be too soon to form a reliable estimate of the public's reception of the new bread. But according to authorities in the trade and well-known dieticians, there is a good future for it, since consumers will readily respond to this improvement in a staple and protective food. The extravagant claims often made for the nutritive properties of the germ are, however, largely discounted.

It is of interest to note that all flour used in New Zealand is milled locally from domestic and Australian wheat, both of which are of the soft variety. In the absence of Canadian flour, which has not been imported since 1938, improvers are used to make up in part for the low percentage of gluten.

Electrical Power in Irish Food Factory

(*Continued from page* 93)

Two condenser water and two brine circulating pumps by the Pulsometer Engineering Co. are installed, these being direct coupled to Crompton Parkinson motors.

The supply is on the maximum demand basis, and in this connection the maximum demand integrating meter, fitted on the main switchboard, is of interest. The period of the Electricity Supply Board is 15 minutes, whilst that of the meter on the switchboard is 5 minutes. This meter is fitted with contacts connected to a Klaxon alarm to work when the demand reaches a predetermined limit. Warning is thus given to the compressor-room attendant that the maximum demand is being approached, and steps can be taken to reduce the load. It has been found in practice that, owing to the very fluctuating nature of the load throughout this factory, this instrument has proved very useful in keeping down the maximum demand.

In addition to the three 70-h.p. motors driving compressors, there are some 60 odd motors throughout the factory, ranging from 25 B.H.P. to $\frac{1}{3}$ B.H.P. Particular care in laying out the installation was taken to standardise, as far as possible, the horse-power, speed and type of motor used—this with a view to interchangeability of motors when required. The majority of the motors are totally enclosed, experience having shown that this type is very desirable in a factory of this description, where the atmosphere is very damp and salty.

Running Costs

Although the new plant has only been running since the end of last April, savings in running costs have proved very considerable. Engine-room attendants, who had a full-time job in the old engine-room, are now able to give more than half their time to routine factory work. Three shifts are worked on four days and two shifts on the other two days.

The expenditure on new plant and rearrangement of the old plant, which has been retained, has proved a valuable investment in this factory; current consumption has been found in practice to be from 30 to 40 per cent. less than what was estimated. The estimate, when the change-over to the Supply Board's supply was being considered, was based on the known anthracite consumption of the suction gas engines, the very conservative figure of 2 lb. of anthracite to 1 kw. of power having been taken.

In another bacon factory carrying out exactly the same processes as are employed at Waterford, but dealing with 30 per cent. fewer pigs, and in which the old-fashioned refrigerating machinery was retained, the current consumption was 96,000 units over a certain period, against 65,000 units consumed during the same period at the Waterford factory.

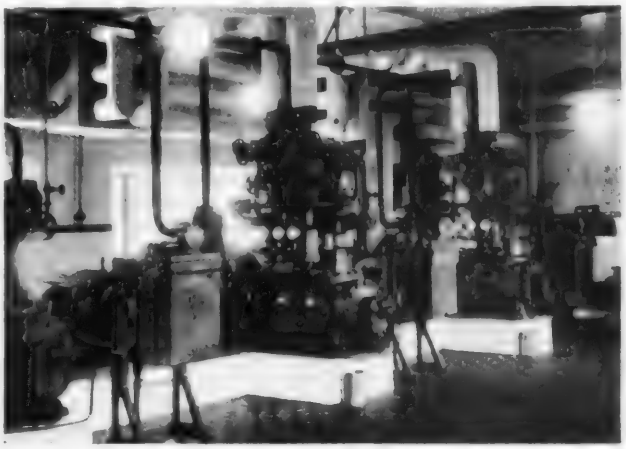
ELECTRICAL POWER IN IRISH FOOD FACTORY

OF outstanding interest in these days of food rationing is the fact that in the last three years the big pig population of Northern Ireland has been more than doubled, with the result that the expansion in the Irish bacon industry has been truly remarkable, for in Eire alone more than a million pigs were used in a single year for curing, the exports of bacon and ham from the six counties amounting to almost £3,000,000, a rate of production which bids fair to make up for the discontinued supplies of Danish bacon. Indeed, it is possible to go further and say that, given the necessary encouragement, the producers of Irish bacon should be able to ensure the greater part of our bacon and ham supplies for all time.

Modernisation of Plant

That the Irish bacon manufacturers are alive to the possibility of securing for themselves the British bacon market is ably demonstrated by the number of factories which are being modernised to meet the ever-growing demands, a fine illustration of this being afforded by the manner in which Messrs. Henry Denny and Sons, Ltd., one of the oldest firms in the bacon curing industry, have rearranged the machinery in their four factories at Waterford, Cork, Sligo and Portadown (which between them average 200 pigs per hour or roughly half a million per annum), so as to allow of more efficient use of electricity.

All four factories of Messrs. Denny take power from public electricity supply concerns; in the case of Portadown, from the Electricity Board for Northern Ireland, and at the others from the Electricity Supply Board for Eire, in all cases supply being at 400 volts, 3 phase, 50 cycles.



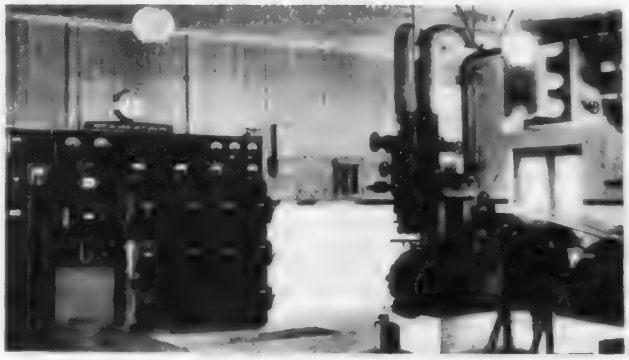
View of compressor room showing controls of three 70 h.p. motors.

The primary product of all these factories is dry-cured bacon, and the by-products are lard, sausages, cooked hams, meat and bonemeal, chandlers' grease, dried blood and dried hair.

The factory at Portadown, which deals with 1,000 pigs a day, is equipped throughout with Crompton Parkinson motors. This installation proved so satisfactory that it was decided to install electricity for drives at their Sligo factory, which was opened in 1936, its capacity being 400 pigs a day.

About the same time as the Sligo factory was being erected Messrs. Henry Denny decided to avail themselves of the Eireann Electricity Supply Board's supply at their Cork factory and to install Crompton Parkinson motors in place of a suction gas plant which was driving D.C. generators. The capacity of the Cork factory is 1,000 pigs a day, and, the change-over having been carried out and some fifty motors, ranging from 75 B.H.P. to ½ B.H.P. being installed, the results were found to be very satisfactory.

The remaining factory of this group, the largest, with a capacity of 1,500 pigs a day, is that at Waterford. It was powered by two 150-B.H.P. suction gas engines driving on to a common shaft, which in turn drove two 110-volt D.C. generators and five 20-ton horizontal Sulzer N.H.3 compressors. In 1939,



Main switchboard.

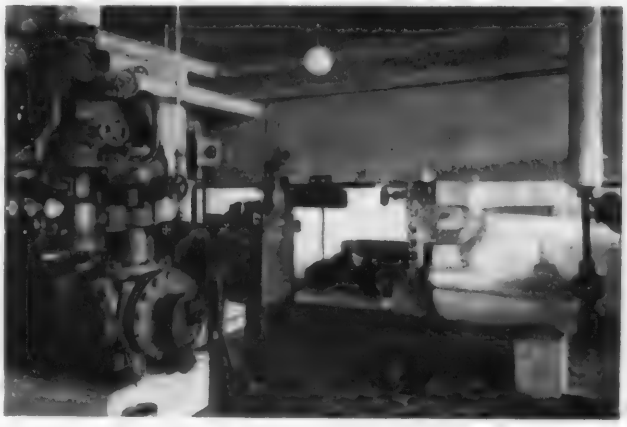
on the strength of the results being obtained with the electrical installations in their other factories, Messrs. Henry Denny and Sons, Ltd., commenced the rearrangement of the machinery and its drives in this factory. The old engine-room was discarded and a new compressor-room built on an adjacent site. Again the motors and switchboard were obtained from Crompton Parkinson, Ltd.; the refrigerating machinery was obtained from J. and E. Hall; while the installation of the electrical equipment was entrusted to Messrs. Keatinge and Gaule, electrical contractors, of Waterford.

Demands of Refrigerating Plant

Very careful consideration was given to the demands on the refrigerating plant, in view of the fact that during the summer months power taken for refrigeration amounts to over 80 per cent. of the total factory consumption; consequently no expense was spared in obtaining plant which would be economical, flexible and reliable.

Experience in their other factories had shown that great economies could be effected in power consumption by arranging the compressor plant in suitable units that could be started or stopped instantly as conditions demanded, and three 8 by 8 twin-cylinder Monoblock compressors, each driven by a 70-h.p. slip-ring motor, were installed. The compressors have split suctions, and each suction is connected through valves to three main suction lines. Thus any cylinder may work on any one of the suction lines. To make the plant even more flexible, the compressors are fitted with half-duty valves.

To ensure correct control over these compressors there was placed in the compressor-room a Negretti and Zambra 16-point distant electric thermometer giving temperature of all curing cellars, chill-rooms and cold stores throughout the factory. This instrument enables the compressor-room attendant to regulate the running of the compressor plant to very exact requirements and to run it at its greatest efficiency.



Corner of compressor room showing two pulsometer brine circulating pumps.

(*Continued on page 92*)

NEWS FROM THE INDUSTRY

Canadian Trade

The War Exchange Conservation Act, 1940, provides for the prohibition of the import, or the restriction of the import, of a long list of commodities, the growth or produce or manufacture of countries outside the sterling area, and at the same time provides for reduced duties, including entry free of duty, under the British preferential tariff on some of these goods and on others.

There should, therefore, be increased opportunities for United Kingdom trade, and the Department of Overseas Trade has published a recently revised "Memorandum on Trade with Canada" (compiled by H.M. Senior Trade Commissioner), and will furnish extra copies on application to the Department at St. Michael's Road, Bournemouth; the reference No. 20976/40 should be quoted.

The Department can also furnish selected lists of importers and department stores, classified according to the goods handled, and of leading manufacturers in the Dominion (as buyers of raw materials and semi-processed goods), rates of import duties and statistics of imports.

The Department is also pleased to receive enquiries from United Kingdom firms desirous of appointing agents, a course that is practically essential in this extremely competitive market.

This notification is being sent to all Export Groups and to the leading Chambers of Commerce.

* * *

Canadian Food Exports

Mr. Gardiner, the Minister of Agriculture, has informed the Canadian House of Commons, says a correspondent of *The Times*, that last autumn the Canadian Government offered to ration butter in Canada in order to provide 10,000,000 lb. of butter requested by the British Government, and were willing to accept the British price of 21 cents a pound, although at that time the domestic price was 24 cents, but when it was discovered that the ultimate effect would be to reduce the surplus of Canadian cheese for export, the British Food Ministry said that it would prefer more cheese.

Mr. Gardiner also disclosed that Canada was acquiring a huge surplus of pork products, as farmers had been recently delivering 3,000,000 lb. each week over and above what was required to fulfil the Anglo-Canadian agreement and for domestic consumption, and, although Great Britain was now taking 1,000,000 lb. each week above the contracted quota, 2,000,000 lb. was going each week into cold storage.

* * *

Beet Sugar

About 500,000 tons of sugar, representing about one-fifth of our peacetime imports and a much larger proportion of our war-time needs, will be produced from last season's sugar-beet crop. In many districts the beets yielded an abnormally high amount of sugar.

Snacks for the Journey

Before taking off on a long-distance bombing raid, pilots and crews of the R.A.F. have a substantial meal, but they are also allowed 1s. 6d. a head with which to buy food to take with them. It is stated that biscuits and raisins are the two most popular items, and that room is generally found for a slab of chocolate, particularly during cold weather. Apples and oranges are taken as thirst-quenchers, and many men include in their "nosebag" some form of sugar—glucose, barley sugar or boiled sweets—as they have found that it quickly banishes muscular fatigue.

* * *

Food Wholesale Prices

British wholesale prices remained practically unchanged during February, for the *Financial Times* index number only rose from 139·8 to 139·9 (1938=100). Wholesale food prices dropped from 129·9 to 129·1. Among cereals, barley and maize were cheaper. There was a further seasonal drop in the price of eggs, but coffee was dearer. Other prices were unchanged. The materials index rose from 144·6 to 145·3.

	Food	*Materials*	*Total* (1938=100).
Aug., 1939 ..	89·6	99·6	96·3
Dec., 1939 ...	121·9	129·0	126·7
Feb., 1940 ...	120·5	132·5	128·5
Aug., ,, ...	124·7	137·7	133·4
Aug., ,, ...	124·7	137·7	133·4
Sept., ,, ...	128·4	137·4	134·5
Oct., ,, ...	130·6	136·8	134·7
Nov., ,, ...	130·8	142·1	138·5
Dec., ,, ...	131·6	142·5	139·0
Jan., 1941 ...	129·9	144·6	139·8
Feb., ,, ...	129·1	145·3	139·9
Y'rs. change	+ 7·1%	+ 9·7%	+ 8·9%
War increase	+44·2%	+45·7%	+45·2%

There has been practically no change in wholesale food prices since the end of September, 1940, but there has been some increase in materials. The war increase in the total index is just over 45 per cent.

* * *

Empire Jam now in Cans

Jam, formerly almost entirely sold in glass, is now appearing in cans. The range covers a complete variety similar to those formerly glassed in this country, but the source is invariably Empire or Colonial, indicating a completely new development in canned goods marketing. Typical lines sold this month include apricot jam (whole fruit), packed by the African Canning and Packing Corporation, Ltd., of Port Elizabeth, South Africa, and marketed under the brand name "Gold Reef", and range of Canadian fruits, canned by the Murray Co., Ltd., of Vancover, Canada, under the brand name "Murray's".

These canned jams are of excellent quality, are selling splendidly, and look like holding a share of the British market when war conditions are over.

Changes in Export Control

Under a Board of Trade Order which came into force on March 27, 1941, the exportation of aluminium hollow-ware is controlled to all destinations, but applications for export licences will not normally be entertained.

Where stocks are held by persons registered under the Limitation of Supplies (Miscellaneous) Orders, the Ministry of Aircraft Production are prepared to purchase such stocks at cost. Persons wishing to dispose of their stocks on this basis should apply to the Aluminium Control, Ministry of Aircraft Production, Southam Road, Banbury.

The exportation of candles, starches, cassava, sago, tapioca, waxes, sparking plugs and certain chemicals is also controlled to all destinations.

Control is imposed on the exportation of casein and certain additional metal ores, but, in these cases, to certain destinations only.

The Order (S.R. and O. 1941, No. 308) also extends the existing control with respect to certain watches and chemicals.

* * *

Air Raid Precaution Bulletins

The third of the Air Raid Precautions Training Bulletins issued by the Ministry of Home Security has now been published.

These training bulletins are intended chiefly for the benefit of instructors, More particularly those in commercial and industrial establishments, who have not the same opportunities of keeping in touch with the latest developments in air raid precautions as the staffs of local authorities. They contain all the most recent information and guidance on the subject.

Bulletin No. 3 consists mainly of important notes concerning anti-gas, high explosives and incendiary bombs. Copies will be sold, on written application to H.M. Stationery Office, York House, Kingsway, London, W.C. 2, by a clerk to a local authority, or by the secretary of a public ultility undertaking or an industrial or commercial concern. The price is 4d. net or 5d. including postage for individual copies. Postage rates for quantities will be furnished on application.

* * *

Raid Spotters

We have received a very timely pocket book entitled *The Raid Spotter's Pocket Book and Log*.

It seems to contain all the information needed for the observer corps, air-raid wardens, and those performing similar duties.

Most of the information required for these as well as for fire watchers, such as recognition of machines, bombing angles, spotting, both visual and sound, is given.

There is also a log, duty roster pages and memorandum pages. It is published by the well-known firm of Charles Letts. The size is $5\frac{7}{8}'' \times 3\frac{5}{8}''$ and sells at 1s. 6d. It seems very good value for the money.

Major Maurice W. Bachelor

The many friends of Major Batchelor, Joint Managing Director of Batchelor's Peas, Ltd., will be interested to hear that he was mentioned in despatches. He was in the evacuation from Dunkirk.

Major Batchelor is, of course, a well-known personality in the food industry, and his cheery presence at the meetings of the Canning and Food Industries Club (late "Can Cans"), of which he was recently President, will be remembered by its many members. He always unfailingly attended the meetings of the Club, often at considerable personal inconvenience. We look forward to future meetings in better times, and doubtless we shall hear a new crop of stories, of which Maurice (as he is affectionately called by his intimates) always has a veritable store.

* * *

Mr. Howard A. Hughes

Mr. Howard A. Hughes, managing director of the firm of Alfred Hughes, Ltd., cake and biscuit manufacturers, of Bordesley Green, Birmingham, has been appointed adviser for the cake and biscuit industry to the Ministry of Food. The managing directorship of the firm will now pass into the joint control of his brother, Mr. Wilfred Hughes, and Mr. J. H. Townend, directors for many years, while Mr. Oliver Sheldon retains the chairmanship.

Mr. Howard Hughes is also a director of the firm of Pattison and Hughes, Ltd., the largest firm of caterers in the Midlands, and also director of the Mikado Cafés, Birmingham.

He is President of the British Cake and Biscuit Association and Vice-Chairman of the Cake and Biscuit Wholesale Manufacturers' Defence Committee. His new duties will involve the setting aside of these two offices as well as a number of others.

* * *

British Timken Staff Developments

British Timken, Ltd., have recalled more of their technical representatives to take up important posts in the works. Mr. C. R. D. Tuckey, the well-known Davis Cup player, who, with G. P. Hughes, won the "Doubles" at Wimbledon in 1936, has been appointed head of the planning department. He joined British Timken, Ltd., in 1937, and until 1940 was representative, specialising in automotive and aircraft products. Mr. H. K. B. Glassey, who has been with British Timken for twenty years, was in charge of replacement sales to distributors and garages handling the requirements of heavy commercial vehicle and large transport undertakings. He has been appointed assistant sales manager.

* * *

Samuel Jones and Co., Ltd.

Messrs. Samuel Jones and Co., Ltd., are now installed in their new offices at 16-17, New Bridge Street, London, E.C. 4. All enquiries and communications of every sort are to be addressed to the above address. The firm's telegraphic address and telephone number remain the same, by special arrangement with the Post Office.

H. E. J. Cory

Having resigned from the board of the Eaglescliffe Chemical Co., Ltd., we hear that Mr. H. E. J. Cory has now commenced business on his own account as manufacturer, agent and merchant, at Eagle Chemical Works, Church, nr. Accrington, Lancs.

His wide experience of export and import markets will be utilised in connection with the materials required for the paint, lacquer, textile, plastic, colour, rubber, ceramic and allied industries, and he will continue to specialise in these.

Mr. Cory has also become a partner in the old-established firm of Bowdler and Bickerdike.

* * *

New Divisional Staff Officer

The appointment of Mr. J. Russell Gales, M.B.E., an experienced food distributor with a record of success in food distribution under actual war conditions, to the post of Southern Divisional Food Officer will be welcomed by the distributive trades in this area.

In shouldering this heavy responsibility, Mr. Gales will be working amongst friends, as he is personally known to most of the Southern Division traders. His fine record in food distribution on a very large scale during the last war is generally known, and the feeling is that he is the right man for the job.

He is, of course, a director of Huntley and Palmers and of Huntley, Boorne and Stevens, Ltd., where for twenty years he has directed the sales and distribution of this great business.

Mr. Gales is also a qualified solicitor, and in dealing with the many problems of the Ministry he should find this additional qualification of considerable value.

* * *

Mr. Albert Van den Bergh

Mr. Albert Van den Bergh has retired from the position of Joint Vice-Chairman of Lever Brothers and Unilever, Ltd., to become an advisory director. He remains chairman of the company that bears his name, with which he has a record of forty-seven years' service.

It was eleven years ago that Van den Berghs were merged with the Lever interests. At that time the company had 15,000 shareholders. Mr. Van den Bergh has taken an interest in every side of the business, and was Joint Managing Director for some fifteen years.

It was he who started for Van den Berghs the first Staff Pensions Fund in 1920, which has now been adopted by all the Unilever companies. Known as the Union Superannuation Fund, it has reserves of over £5,000,000, and Mr. Van den Bergh is still chairman of it.

* * *

Ministry of Agriculture Appointment

The Rt. Hon. R. S. Hudson, M.P., Minister of Agriculture and Fisheries, has appointed Mr. J. A. Sutherland-Harris to be his Principal Private Secretary vice Mr. H. Meadows, transferred to other duties.

* * *

A Well-known Dutch House Carries On

The enterprising firm of Polak and Schwarz appreciate the signs of sympathy manifested by the ready co-operation not only of business friends and commercial relatives, but by competitors who have done all possible to help. It is gratifying to find the directors expressing their appreciation of the assistance afforded by the various Government departments concerned with the many new Orders and Regulations, and heartily dissociating themselves from the customary criticism of the Civil Services. So, notwithstanding the inevitable handicap to commercial practice, pleasure in trading has been imparted by the prevailing mood of goodwill, and the fact that the seat of the Netherlands Government is in this country has been of no small help in this direction.

The production at the new factory of perfumery specialities and flavourings has gone ahead, and great stocks have been laid in from original import. Manufacture proceeds very smoothly on a highly developed scale of pure fruit extracts, pastes and juices, as well as all the essentials of the mineral water and other industries, including the new series of "Bonita" and "Viva" orange and lemon concentrates which contain a guaranteed proportion of fruit.

* * *

Meat in the U.S.A. Army

Armed forces of the United States—claimed to be better fed than any in the world—eat considerably more than twice as much meat as any other group of consumers. Estimates made by the American Meat Institute and based upon the most recent figures available from the office of the Surgeon-General of the army show that the new recruit, on entering the army, finds himself eating meat at the rate of approximately ·88 lb. per day, or well over 300 lb. per year. A well-nourished body and an alert mind are of first importance for the soldier, whether he is drilling or working over blueprints and maps. The civilian *per capita* consumption last year was approximately 141 lb.

Screw Cap Machine

We have received details of a new machine for screwing bakelite or metal caps on bottles and containers. Of streamline design and bench type it can easily be put on any conveyor and will screw bakelite caps up to 3 ins. diameter without damage either to print or material of cap, the working parts being made of special rubber.

The machine will handle bottles and containers of any shape or size, and no changing of tools is necessary to switch from one size and shape to another. The adjustment to the height of the container is made by the simple operation of loosening and again securing two screws.

The closing and tightening of the caps is effected in one operation, and the degree of tightness is readily adjustable, and once the adjustment is made the caps are turned out with uniform tightness.

The machine is run by a built-in $\frac{1}{8}$-h.p. motor, and its output is 25,000 bottles in 8 hours.

The makers are Richard Brandt.

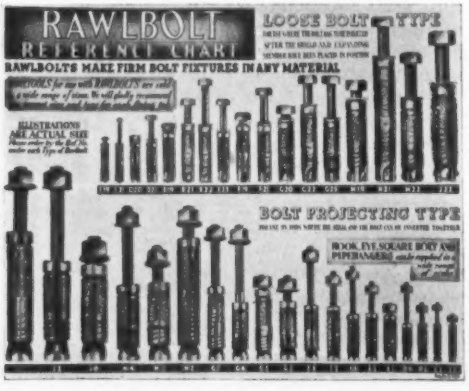
* * *

Arkon Valve Position Indicator

In operating steam-heated or steam-driven equipment, correct valve setting is important. Thus in manufacturing and processing operations it is desirable to know the exact amount of gas, water, oil, or other fluid passing through the valves. Visible indication of the valve setting removes the need for continual inspection by the foreman or person in charge, a time-wasting procedure and one which usually entails a certain amount of guesswork.

A visible type of valve-setting indicator, which shows at a glance the exact degree the valve is open, is the Arkon Valve Position Indicator. This indicator takes the place of a hand-wheel. It incorporates a dial, suitably graduated, over which a red segment moves, indicating the valve opening; hence with the valve shut the red portion is not visible. As the valve opens the red segment moves across until, in the fully open position, it entirely covers the dial. The indicator is extremely sensitive in operation, and, once the correct setting for any process is determined, the valve can again be quickly and accurately regulated to the same position. It is easily read even from a distance, and can be fitted to any type of screw-down valve in either horizontal or vertical positions.

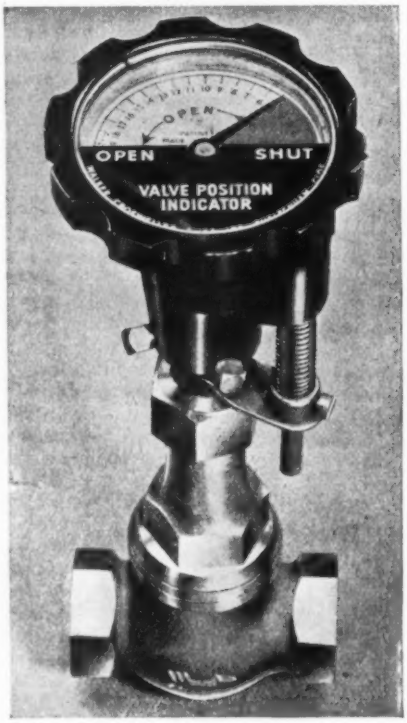
The indicator is a product of Messrs. Walker, Crosweller and Co., Ltd.



Rats—A "Sixth Column"

Continually raiding food supplies, the hordes of rats which still consume and destroy vast quantities of foodstuffs are a veritable "sixth column". Amongst modern methods of rat destruction should be noted the highly successful sticky traps of Dak ratlime, which are now widely employed by farmers and stock breeders. Besides the important advantage of safety, for they are free from the dangers of poisons and virus, the sticky traps of Dak require little attention beyond replacing the Dak removed with the victims.

Details of the sticky trap method are given in a Ministry of Agriculture Bulletin, obtainable price 6d. from H.M. Stationery Office, or readers can obtain a pamphlet post free from the makers of Dak Ratlime, Messrs. Kay Brothers, Ltd.



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Rawlplug Fixing Devices

Modern civilisation is based upon mechanical efficiency, and at the foundation of mechanical efficiency stands the screw and the bolt. The Rawlplug fixing devices are effective ways of anchoring the screw and the bolt. The Rawlplug Company, Ltd., claim for their devices the perfect system for connections to certain materials. As an instance, the use of white bronze plugs precludes altogether the possibility of an ugly, lasting, but easily made stain, which results from the use of other materials on Portland stone.

By the use of these methods the extensive amount of cutting away necessary in the use of old methods is entirely eliminated and the work usually covered by three trades—viz., bricklayer in cutting holes, making fixtures, and making good with cement; plasterer in facing up; and painter in redecorating—is done by one operative occupying only a fraction of the time.

Protection Against Corrosion

A new modification of "Detel", known as "Export D.M.U.", which has the very great advantage that it will stand boiling water, should be of considerable interest to the food industries.

The product is chlorinated rubber mixed with a large proportion of finely divided zinc, and possesses remarkable properties as regards protection against corrosion from the atmosphere and from water, including sea water, while it is easily applied with a paintbrush.

It is practically as resistant as galvanising, and actually more so as far as actual corrosion is concerned. Its easy application and the fact that ample supplies are available are obvious advantages. It is well known, of course, that there are difficulties in this connection with galvanising because of the war.

Hitherto ordinary "Detel" has not been resistant to warm water over about 112° F. merely because it caused a slight softening. The new variety, however, is resistant to 212° F., which is a very different matter, and consequently it can be applied in connection with all kinds of hot-water equipment. It is made by Detel Products, Ltd.

* * *

Power Transmission Appliances

All power users will be interested in the new catalogue issued by the London Shafting and Pulley Co., Ltd. It contains a very complete list of power transmission appliances, and the illustrations and information given should be of considerable value in working out power transmission problems.

We are informed that a large stock of appliances is always maintained in London, comprising over 20,000 pulleys of all types and a large quantity of shafting and fittings of every description.

At the end of the catalogue is given a useful table in feet per minute, giving circumferential velocities of pulleys ranging from 12 ins. to 96 ins. diameter, running at the various speeds named. Also a table of horse-power transmitted by single leather belts of different widths at varying speeds. A wrought-iron pulley horse-power chart showing the horse-power which can be transmitted at 100 r.p.m. by a normal single-arm pulley or ordinary riveted type, which may be taken as a rough guide in calculating drives to determine whether pulleys of normal strength will be suitable. The catalogue is well indexed.

* * *

Ice-Cream Propaganda

We have received from Facchino's Purity Biscuits, Ltd., an eight-page booklet constituting publicity for ice-cream as a food. The publishers state that "the public conception of ice-cream as a mere delicacy of not great importance is altogether wrong and that such a misapprehension cannot but be prejudicial to the health of the nation and to the interests of the ice-cream trade". The booklets will be supplied to ice-cream traders at cost price by the above-mentioned firm, the idea being that these traders shall distribute the copies among their customers.

INFORMATION AND ADVICE

Meat Pastes—Food and Drug Regulations—Custard Powder—Information Supplied—Information Required.

Meat Pastes

6,809. *We note in a recent issue a description of a plant manufacturing and packing assorted meat and sandwich pastes. We would greatly appreciate your supplying us, if possible, with recipes for the manufacture of such a paste. If you are unable to supply the recipes yourselves, we would be much obliged if you could name a source from which we can obtain them.* (Vancouver.)

If you have a copy of FOOD MANUFACTURE for July, 1939, you will find a very informative article on the subject, which gives principles but not recipes. In this country there is a difference between the regulations regarding "potted meats" and "meat pastes". "Potted meats" are supposed to be as described—*i.e.*, meats without extraneous additions—and the product described as "paste", on the other hand, is a compounded article. We presume that you are seeking recipes for the latter type, and give you one or two suggestions as a basis for experiments.

Ham, chicken and tongue paste may have as the basic formula:

Corned beef	3½ lb.
Boiled ham	1 ,,
Boiled tongue	1 ,,
Butter or margarine	1 ,,
Chicken	according to the quality desired.

For seasoning:

White pepper	½ oz.
Ground parsley	¼ ,,
Cayenne pepper	⅛ ,,
Salt added at discretion.	

Cereal matter such as rice, wheat, rusk or sometimes soya flour may be added as a filler. In cheaper pastes the percentage of filler is, of course, considerable.

Food and Drug Regulations

7,147. *We should be glad if you could advise us if there are any Food and Drugs Act regulations appertaining to the manufacture and sale of Custard Powder.* (Manchester.)

With regard to this enquiry, you should refer to the Food and Drugs Act, 1938, as we do not think you intend to refer to any other legislation. On the score of emergency legislation you may have difficulty in obtaining supplies of starch, etc., and the best course would be to write to the Ministry of Food if any difficulty is encountered in obtaining supplies.

The only regulations definitely affecting the composition of Custard Powders are the Public Health (Preservatives, etc., in Food) Regulations, 1925-1939 (really 1925-1927, as the recent additions cover the use of nitrate in cured meat). These regulations control the use of certain prohibited dyes, usually nitro-derivatives or compounds of poisonous metals, and the use of preservatives in starchy mixtures. Custard Powder, being made of dried starch, should not contain any sulphur dioxide.

Custard Powder

7,316. *We should be obliged if you could let us have some formulæ for custard powder.* (Manchester.)

The following formulæ will serve as a basis for trials on custard powder manufacture, the ingredients being somewhat altered in amounts if the properties given by these formulæ are not quite what is required:

Unsweetened Custard Powder.—Cornflour 600 lb., finely ground rice flour 6 lb., sago starch 54 lb., salt 3 lb., essence to flavour to taste probably about 1½ to 2 lb.

Sweetened Custard Powder.—Cornflour 600 lb., finely ground rice flour 12 lb., sago starch 43 lb., salt 6 lb., fine sugar 480 lb., saccharine 12 ozs., essence to flavour as above.

To colour the products a master batch of coloured material is made first, for example, as follows: The dyestuff, which should be of foodstuff quality and obtained from a reputable manufacturer, is dissolved in water at the rate of, say, 1 lb. of dyestuff to 2 gallons of water, if necessary heating to obtain complete solution. Cool, and when quite cold strain through a fine cloth to remove any particles of colour which have escaped solution and mix with about 250 lb. of dry cornflour. After thoroughly mixing, the damp powder is remixed with a further 400 lb. of dry cornflour, and this constitutes the master colour-batch. To colour the custard powders some of the cornflour in the above formulæ is substituted with an equal amount of the master batch colour. Start by introducing about 20 to 30 lb. of the master batch and increase or decrease according to whether it is desired to strengthen the colour. The colour comparisons should, of course, be made on the cooked custards, as the colour will develop when water is added to the powder. The essence may be added to the master-batch if desired so as to give a perfectly even distribution of flavouring matter. The mixings can be done in either a proper mixing machine or a half-filled rotating barrel. After mixing and allowing to stand for some hours the incorporation of the ingredients can be *perfected* by passing through a fairly fine sieve.

Information Supplied

7,118. *I am interested in the Cheese-Melting Salt reviewed in the November issue of* FOOD MANUFACTURE, *and shall be glad if you will let me have the address of the manufacturers.* (Macclesfield.)

This was done.

7,125. *We shall be glad if you will kindly let us have as soon as possible the names and addresses of suppliers of Desiccated Coconut.* (Surrey.)

Names were given.

7,149. *I would be grateful if you would let me know the names of any suppliers of machinery suitable for pulping and drying potatoes before converting them into potato meal.* (Eire.)

Names of firms were given.

6,256. *We are particularly interested in the questions and answers which are given in each issue, and we should like to enquire whether you would be good enough to give us the names of the suppliers of a complete range of margarine plant referred to in your issue of December 1, 1939, page 397.* (South Africa.)

Names were given.

7,005. *I wonder if you could kindly let me have names and addresses of any makers of small shredding machines suitable for vegetables, also small low-pressure steam cookers for same.*

I am enclosing an illustration of an American machine which gives an idea of what I am wanting: the K. and K. Commercial Shredder is the type I have in mind.

I require these in connection with some experiments I am making with vegetable juices, so the cutter should be of stainless steel or other suitable metal.

Also can you advise me of any books on the subject of these juices which might be helpful to me? I have a copy of Fruit and Vegetable Juices, *by Tressler and others, but this touches only lightly on vegetables, as you doubtless know, most of the matter dealing with fruit juices.*

Any assistance you can give me will be very greatly appreciated, for which I thank you in anticipation. (Berks.)

Information supplied.

6,702. *Kindly give us names of suppliers of dextrines suitable for use in edible products—referred to in the interesting article on "Potato Products" in your issue dated September 2.* (Eire.)

Although there is some doubt whether potato dextrine is available at the present moment, the names of suppliers of this and other edible dextrine and crystal gums were given.

Information Required

7,334. *We shall be greatly obliged if you will be kind enough to let us know the manufacturers of a coffee product in powder which completely dissolves in water, leaving no grounds. We are interested in bulk quantities.* (Glasgow.)

RECENT PATENTS

These particulars of new patents of interest to readers have been selected from the "Official Journal of Patents", and are published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

Abstracts of Recent Specifications

Group Abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, either sheet by sheet as issued on payment of a subscription of 5s. per Group Volume, or in bound volumes price 2s. each.

Vitamin B Complex Compositions

The invention describes a process for producing one or more compositions of the vitamin B complex by which the component or components are synthesised by subjecting a fermentable carbohydrate-containing mash to the fermenting action of butyl alcohol-producing bacteria. The invention also contemplates a process for the production of compositions containing one or more components, such as the heat-stable components, of the vitamin B complex, which comprises concentrating the residual solids in distillation slop from a butyl alcohol fermentation process. Production of vitamin G by similar methods is also within the scope of the invention.

Until recently the distillery slop in the butyl alcohol fermentation industry merely constituted a waste product which was run into the rivers for disposal, and even became an item of expense owing to regulations relating to stream pollution. A similar situation was encountered in respect to the production of feeds, particularly in the case of slops from molasses mashes.

The inventors made the surprising discovery that the vitamin content of the fermentation residue far exceeds the vitamin content of the initial mash, and have demonstrated that the butyl alcohol-producing bacteria actually synthesise vitamins during the fermentation of carbohydrate mashes, and that relatively large amounts of the B complex are thus produced.

527,478. Commercial Solvents Corporation.

Improved Apparatus for Tendering Meat

This invention describes apparatus for improving the quality and condition of meat of the kind embodying a hand tool consisting of a knob or handle which may be grasped in the hand, and a plurality of thin blades carried thereby so that they may be directly thrust by hand into the meat to be treated, thereby cutting the sinews and tissues embedded in and between the meat fibres without damaging the meat itself so that the condition of the poorer cuts may be improved and they may be made to approximate to the more expensive cuts both in flavour and cooking qualities.

The invention consists in meat tendering apparatus of the kind referred to in which the handle is hollow and completed by a cap to close the same, and also consists in meat tendering apparatus in which the blades are of comb-like formation and are shouldered and held in place in the handle by the cap.

In carrying the invention into effect in one convenient manner improved apparatus is provided with a knob or handle of convenient size and shape such that it may be grasped in one hand.

The knob or handle may be formed from wood, bone, ivory, ebonite, phenolic condensation product, casein product, or other suitable material, and it is adapted directly to take a number of thin blades or knives which may either be secured individually in position or may be formed in groups, such as a series of comb-like blades, or they may be formed in one block, it being understood that however the blades are formed they are secured to the handle either by being directly moulded or embedded therein or by being inserted in slots or openings in which they may be secured by screws, rivets, or otherwise. In a specific example there may be, for example, forty-two blades in the one device, but this number is given purely by way of example and is capable of being varied as may be desired. Each blade may be of plain formation with an inclined or pointed cutting end, or the end may be formed with several cutting points or prongs, and in any modification of the invention the blade may be formed with a single flute or channel or with multiple flutes or corrugations. When the blades are formed with inclined points the direction of inclination of the points may be alternated for successive blades or groups of blades.

The arrangement is such that the device may be grasped in the hand and directly thrust into the meat to be treated and then easily withdrawn for insertion into another part of the meat, so that the whole may be properly and adequately treated.

527,694. Joseph Moldawsky.

Latest Patent Applications

16141. COCKBAIN, E. G., TIMMIS, G. M., and IMPERIAL CHEMICAL INDUSTRIES, LTD.: Emulsions for pharmaceutical, etc., purposes. Nov. 6.
16188. FREEMANTLE, H. R.: Manufacture of milk cartons, etc. Nov. 6.
17871. ENAMELLED METAL PRODUCTS CORPORATION (1933), LTD., and BURNS, W. L.: Jacketed containers. Dec. 19.
17933. SMITH, R. W.: Cold-storage locker rooms. (United States, Dec. 23, 1939.)
18077. TEMPLETON, R. A. S., and FARMERS' MARKETING AND SUPPLY CO., LTD.: Method and means for drying vegetables. Dec. 24.
18145. RADIATION, LTD., TWIGG, W. R., and STRINGER, W. L.: Gas cookers. Dec. 26.
18166. EVANS, D. J., and E. C. D., LTD.: Apparatus for preparing liquids. Dec. 27.
18168. TRAMER, LTD., H., and TRAMER, H.: Containers. Dec. 27.
18242. WALMESLEY, R. A., and IMPERIAL CHEMICAL INDUSTRIES, LTD.: Recovery of glycerine from fermented liquors. Dec. 31.

Specifications Published

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

527,314. CROWTHER, H. A. H.: Pasteurisation and sterilisation of bottled goods, and materials for use therein.
528,108. REICH, E.: Apparatus for cooking or heat-treating food and other substances.
528,123. REDDIE, L. N. (GIRDLER CORPORATION): Process and apparatus for the preparation of margarine and like oil or fat, and water emulsions.
528,220. NIETIEDT, A.: Method for preserving meat.
529,468. JEFFREY, R.: Apparatus for roasting grain.
529,518. SIMON, LTD., H., and LOCKWOOD, J. F.: Milling of wheat flour.
529,548. WARD BAKING CO.: Protecting material susceptible to mould growth.
529,745. MUSHER FOUNDATION, INC., and CLARK, C. M.: Preservation of ice-cream and sherbets. (Addition to 506,031.)
529,834. HIRON, H. W. M., and LARSEN, M., ZEUTHEN, C., and ZEUTHEN, R. (trading as Silkeborg Maskin-Fabrik, Zeuthen Og Larsen): Methods and apparatus for the pasteurisation of liquids.
530,237. BAUER, E., and GES. FÜR NEUZEITLICHE BODENBEHANDLUNG: Methods and apparatus for testing flour. (Cognate application 33327/38.)
530,646. DEWEY AND ALMY, LTD. (DEWEY AND ALMY CHEMICAL CO.): Packaging of articles, particularly perishable foodstuffs.
530,652. HANKEY, A. E.: Closure and pouring means for milk bottles and like containers.

TRADE MARKS

The list of trade marks of interest to readers has been selected from the "Official Trade Marks Journal" and is published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

FRONT ROW.—608,375. Bread, confectionery, biscuits and cake (other than biscuits and cake for animals). **Weston Foods, Ltd.**, 309, Thames House, Millbank, London, S.W. 1; and 504, Buckingham Avenue, Slough, Buckinghamshire.
Proceeding under Section 29 (1) (b).

GALA DAY.—608,376. Biscuits (other than biscuits for animals). **Weston Foods, Ltd.**, 309, Thames House, Millbank, London, S.W. 1; and 504, Buckingham Avenue, Slough, Buckinghamshire. (Associated.)
Proceeding under Section 29 (1) (b).

DARIGOLD.—609,273. Ice-cream. **Consolidated Dairy Products Co.**, 635, Elliott Avenue West, Seattle, Washington, United States of America.

GEISHA.—610,204. Butter, black puddings, brawn, cheese, cheese paste, cocoanut fat (for food), cocoanut oil (for food), cooking oil, cooked or dried peas, eggs, soup extracts; dried, boiled, preserved and tinned fruit, ham, herrings, jams, junket, lard for food, dried lentils, margarine, marmalade, mayonnaise, meat, meat extracts, meat jellies, pickles, potato chips, sausages, vegetable soup preparations, soup powder, soups, suet, peeled tomatoes, tongues (for food) and tripe. **Frank Farrands, Ltd.**, 108, Mansfield Road, Nottingham. (Associated.)

NEW COMPANIES

Bakery Mutual Products, Limited. (364647.) 3, Arundel Street, W.C. 2. Nom. cap.: £100 in 1s. shares. Dirs.: To be appointed by subs. Subs.: S. F. Wright, 61, Albany Park Road, Kingston-on-Thames (clk.); H. C. Cartwright, 100, Lynwood Drive, Worcester Park, Surrey (clk.).

C. E. Coggan, Limited. (364694.) To carry on bus. of mnfrs. of and dlrs. in supplies for butchers, grocers and others, etc. Nom. cap.: £3,000 in £1 shares (1,000 cum. pref. and 2,000 ord.). Dirs.: To be appointed by subs. Subs.: D. E. Baldery, 31, Thicket Road, Sutton, Surrey (clk.); W. G. Pearson, Kingsmere, Northumberland Avenue, Laindon, Essex.

C. H. Trengove and Co., Limited. (364696.) 105, Bermondsey Street, S.E. 1. To take over bus. of specialists in bakers' sundries, etc., cd. on at Bermondsey as "C. H. Trengove and Co." Nom. cap.: £1,000 in £1 shares. Dirs.: C. H. Trengove, 160, Hook Rise, Tolworth, Surrey; Kitty Trengove, 160, Hook Rise, Tolworth, Surrey.